RAILROAD GAZETTE

FRIDAY, DECEMBER 9.

Coaling Station at Gray's Ferry, on the Philadelphia, Wilmington & Baltimore Railroad.

There is, probably, no work on a railroad which is done in such a variety of ways as that of handling and supplying coal to locomotives. Nearly every road has its own particular method of doing it, which is in a measure determined by circumstances, tradition, or perhaps prejudice. The plan which we illustrate in this number is one which was designed by Mr. S. T. Fuller, formerly Chief Engineer of the Philadelphia, Wilmington & Baltimore Railroad, and patented by him and Mr. Charles A. Merriam, and erected at Gray's Ferry on that road.

The arrangement consists, in the first place, of an inclined track, shown in profile by fig. 1 and in plan in fig. 2, laid alongside the main line. At the end or top of this incline is a coal-shed with suitable pockets in which the fuel is stored. The loaded coal cars are run up this incline to the shed and are then unloaded. The track on which the cars are received is in the centre of the shed, as shown in the plan. On each side of it are two narrow-gauge tracks *T, T*, but on a lower level than the middle track. On these side-tracks small iron cars, figs. 11 and 12, are run, which are loaded with coal to be supplied to the engines. The shed is elevated sufficiently above the main tracks outside so that a bridge *B*, *B* can be carried across them from the former. On this bridge a track is laid which connects with the narrow-gauge tracks already referred to by turn-tables *C,C*, fig. 2. The iron cars can thus be filled with coal and run on the bridge to any required point. Figs. 3, 4 and 5 represent an elevation, plan and section of this bridge, which, it will be seen, crosses four tracks. Over each track is a suitable opening in the floor of the bridge and underneath are chutes or spouts, shown in fig. 3, which can be raised or lowered to conduct the coal to the tender.

The other figures represent the details of the structure, and require no explanation. The whole plan has been worked out with a great deal of care, and before leaving the Philadelphia and Wilmington Railroad Mr. Fuller wrote: "It only costs us about one-fourth as much to handle our coal as formerly, not counting the great saving in time. An engine now takes coal in one to two and a half minutes, without dust or scattering of coal. At points where a natural incline to store cannot be had, a steam vertical lift can be used."

Contributions.

Breaking Joints with Rails on the Elevated Roads.

NEW YORK, Nov. 25, 1881.

TO THE EDITOR OF THE RAILROAD GAZETTE:

On the Third avenue elevated the track was originally laid with the rail-joints square opposite each other, as it should be, but now the track gang is engaged in drawing ahead one line of rails until the joints face the centres of the opposite rails. The bad effect of this is very plainly perceptible in the zig-zag motion of the cars when running rapidly on a down grade with steam shut off. I am no believer in the zig-zag system of joints on any kind of road-bed, and it seems particularly ill-adapted to a structure which should be spared all possible exposure to lateral strains. H.

[The authorities of the elevated railroads believe that they are following the best practice in changing their track so as to break joints, *for tracks on bridges*. The Pennsylvania Railroad, which puts the joints opposite on road-beds, breaks joints on bridges. It is claimed that the shock to the structure is less when the blows at the joints are not simultaneous. We have all heard how a column of soldiers is likely to break down a bridge if it crosses it marching to the drum beat, and that therefore the order "route step" is given on approaching such a structure.—EDITOR RAILROAD GAZETTE.]

Why Cars Should be Ventilated.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Some health reformers conceived the notion of ventilating a certain sewer in a good neighborhood in London. The purpose was a good one; but it was executed by taking off the solid iron cover of the street sewer man-hole. The master of a large boarding school near by protested; but the reformers refused to give up their notion further than by replacing the cover by a filter of charcoal. Again protest was made with the additional definite warning of danger to the neighborhood, and especially to the school, from pneumonia.

The warning was followed by the fact; one servant and one, if not several, of the students died; the pneumonia was of an unusually fatal type.

The incident is full of lessons, and we cannot avoid pointing out that most men are very apt to read in it one which is utterly false. It was *not* the enthusiasm of these men which was dangerous, but their inadequate knowledge. It is Nature's own lesson in disease, and especially in pestilence, and above all in her age-long war of the survival of the fittest, that power, motive, vigorous effort leading to a more abundant and more highly organized life, are worth almost any price, even of death and pain.

In dealing with this subject of ventilation, even the ventilation of a sewer, full and comprehensive knowledge is needed, for the mistakes of reformers come from *definite but limited and narrow views*.

I make bold, therefore, to ask every man who is at all interested in this subject of car or station construction to carefully read this letter. Much will be said which is not new, but the attempt will be made to give such fresh and definite statements as one makes who has long and thoughtfully studied a matter of interest.

The first but less common danger of bad air in cars and stations is from contagion, especially to children. As a rule, the place for children under seven years is not in so public a place; yet, as they must and will travel, it should get attention that both they and their seniors get fatal acute disease on the cars.

The great Pasteur, second only to Darwin in his wonderful demonstrations of the relations of living beings to each other, has not only almost shown us how these diseases come about, but seems about to tell us how they may be prevented by inoculation. There is no higher authority, and he writes: "There are no epidemic media (milieux epidemiques—epidemic constitutions). That which to me corresponds to this term—as I have proved demonstratively for the febrine of silk worms—is a greater or less abundance of germs of the disease." I am not entirely satisfied of this, but it is the only sure foundation. *The less fresh air in a car or station where there is a child or person sick with an acute contagious disease, by so much the multiplication of the danger to every unprotected person.*

He who says such sick persons are not to be found on the cars should say he has never discovered them, for they are there much oftener than he or perhaps the general public supposes. They are there in the early or premonitory stages of disease; they are there in its later, convalescent, but still contagious stage; and at such times all the fresh air possible is needed to dilute the poison. Close, impure air gives the lungs the essence of it, and then depresses the system by its carbonic acid and other exhalations until it is ready to be infected.

I draw this picture in strong colors, not that I would exaggerate the danger, but in order to impress by its symbolism what is going on always where every person in the car is even an Ajax, namely, the slow temporary poisoning influence of noxious air.

This influence is only temporary, and, except in the case of weak persons, leaves little or no trace of itself an hour or two afterward. The danger arises mainly when the persons so poisoned go into the cold air, especially if it have any chill of dampness in it. This danger is increased if the person be not in immediate vigorous health (however strong usually), or if weary, or if the heavy overcoat or shawl have been kept on the body while in the close, heated car.

The definite dangers of the contact of the cold air with the skin and with the throat and lungs of persons so temporarily debilitated by close, hot air are probably more in number than we know. They are quite certainly pneumonia, severe and slight colds, and internal inflammations.*

We must not exaggerate these dangers in any individual case. If we would know their reality and feel its true importance we must apply some percentage to the thousands of travelers, and the thousands of times they leave the cars after a ride of an hour or two, or ten. We must make a specially larger percentage for those who travel on close, crowded night trains, and go out into the damp coldness of the early morning. Then we must compare our results with the percentage of accidents, whose few deaths so frightfully startle us.

We shall not even then have made a fair comparison, for the percentage of still another and more immediately definite danger remains to be computed.

Besides other six or seven senses, the body (or more strictly the brain) has an oxygen sense, which measures the required amount of oxygen against the stock on hand.

The French call this sense *besoin de respirer*, and we are all familiar with it who have gone from the fresh, brisk air into a close, stuffy room or car. It is like the sense of taste, easily educated, and quite as easily dulled and made stupid.

Healthy persons much in the open air, however, are often very uneasy on coming into close rooms, and although they may after a time become accustomed to the lack of oxygen, they have a strong internal craving to open a door or window.

As our cars are now supplied with air, and as the seats and windows are arranged, this *besoin de respirer* and the windows it puts up are the fear of all travelers. For the first makes each who suffers uncomfortable, and the second makes all who seek relief from the unpleasant sensations dangerous enemies to any weak or debilitated or tired person who sits near them, on the same or the opposite side of the car.

Every car in motion offers the force; the stove and its heat offer still more; it needs only the genius to use these properly to give us (the whole car-full) pure air without draught. The mistake must not be made, however, of supposing a merely cold car a healthy one; it is only more dangerous than a warm car. There must be sufficient heat, and in addition an abundance of pure air.

THE UNCLASSIFIED TRAVELER.

* In order to avoid any difficulty in the minds of those who *will* investigate such matters for themselves, the warning should be given, that sudden (or croupous) pneumonia, in distinction from that form which comes from and by a severe bronchitis, is regarded by many Germans and some Englishmen, and a few Americans (notably by one able one) as somewhat of a specific fever. The influence of cold, however, when the nervous system is exhausted by foul air, over-work or other cause, cannot be disregarded. In general, there is little danger of taking cold if the nervous mechanism controlling the blood vessels of the skin (especially) and the lungs is in good working order. This mechanism, however, is subject to temporary paralysis, as well as chronic sluggish action. The reason for taking cold morning washes or baths (avoid the full bath in cold weather, but not in spring or summer or fall) is the education which they give to this nervous mechanism, training it to act promptly in closing the blood-vessels of the skin on the first touch of cold. The fact that persons confined in factories, persons overworked, persons under the poisonous influence of sewer-gas, all of us in these Northern states after our hard winter (*i. e.*, in the month of March, sometimes also even in May) suffer most from pneumonia points with that many-handed practical proof which is so much surer than any technical influence in such cases. The technical evidence, however, is not wanting, as the only definite theory of the disease is that which demands the action of cold. If enginemen do suffer from pneumonia, they should look well to prevent the escape of the gases from the fire, and that they are not worn out by excessively long runs.

The Early History of Railroad Signals and Telegraphs.

[Translated for the *Railroad Gazette* from Baron von Weber's work on "Railroad Signals and Telegraphs."]

(*Continued from page* 680.)

With regard to railroad signaling, this tendency at the time when the principal lines of communication began to connect together the chief centres of physical and moral life in Germany, in the years 1840 to 1850, was directed toward standpoints from which the most important part of the subject was invisible.

The important point of a good system of railroad signalling does not chiefly consist in informing the employés of the whole line of every arrival and departure, but in the practicability of establishing the most complete, rapid and certain communication possible between the termini of single sections of the road, whether they consist of stations, stopping places, or of signal stations constructed for the especial use of the railroad telegraph.

When, for instance, two consecutive stations are capable of fully communicating to one another what is passing between them, there is really no signal necessary for the road men in order to insure regular service, and should irregularity occur, the single signal "attention," expressed with the greatest simplicity, would suffice.

A second troublesome circumstance lay in the endeavor to constitute a system of signaling that would place every point in the road in communication with every station, so as to facilitate the calling of assistance from any place and the giving of every other kind of information. As this demand was very unsatisfactorily met by the then known portable electric apparatus, and prejudice made the difficulties that lay in the way of instructing the officials and handling the apparatus appear disproportionately great, the officials remained longer than was necessary busied with the development of signaling arrangements that should answer every requirement, and they employed the most familiar and generally comprehensible form of signaling, viz., the optical.

Meanwhile, it was believed that too much attention could not be paid to the desirability of informing, where possible, every track watchman of what was to occur on the line next, so that he might know, not only if the regular trains had left the next station, but also the nature of irregular trains and in what direction they were moving.

Partly, but only partly, this was traceable to the construction of the German railroads, with their countless level crossings, etc., the traffic on which must be interrupted only for as short a time as possible but chiefly, the whole endeavor was attributable to that spirit of tutelage, the lack of confidence in the personal attentiveness, the personal zeal of the employés, which is itself the worst enemy of these valuable characteristics.

Thus was developed, after the pattern of the Leipzig & Dresden Railroad, particularly on the lines in those provinces of Germany where theoretical speculation is most active, the multiform optical-acoustic systems of signaling, of which over one hundred German signal books bear witness, and which will furnish the investigator with the material for highly interesting conclusions respecting the wonderful phases that the same technical idea must pass through in order to be at last embodied in a practical form.

In the zeal of pursuit of theoretically well grounded tendencies we forgot the truth that to us Germans should be most familiar, that nothing as a rule is worse performed than that which is intrusted to many hands and many heads.

This was, however, the case with all signal systems where the signals were passed from hand to hand; the mistake of a single one was transmitted continuously by the many, and moreover, these "many" were uneducated persons, occupied in many other ways.

In the year 1838 the above-mentioned first signal book of the Leipzig & Dresden Railroad was printed. It already called for the transmission of sixteen communications by means of 24 signs, of which 20 were optical, and among them again were nine which could be given by day or night.

These 16 ideas, in the words of the book, were as follows:

1. The road is clear.
2. Everything is in order.
3. The train must go slowly.
4. The train must stop.
5. The train has stopped.
6. The train is not coming.
7. Another engineman must be dispatched.
8. To mark the section.
9. To mark the hour when an extra trip will be made.
10. Attention! } Signals by the locomotive.
11. Brakes! } Signals by the locomotive.
12. Brakes off! } Signals by the locomotive.
13. Start. } Signals by the locomotive.
14. Attention. } Conductor's signals.
15. Stop. } Conductor's signals.
16. Signal for an extra trip. } Conductor's signals.

Several of these signaled ideas then regarded as necessary were so on laid aside as immature, but the number of signals

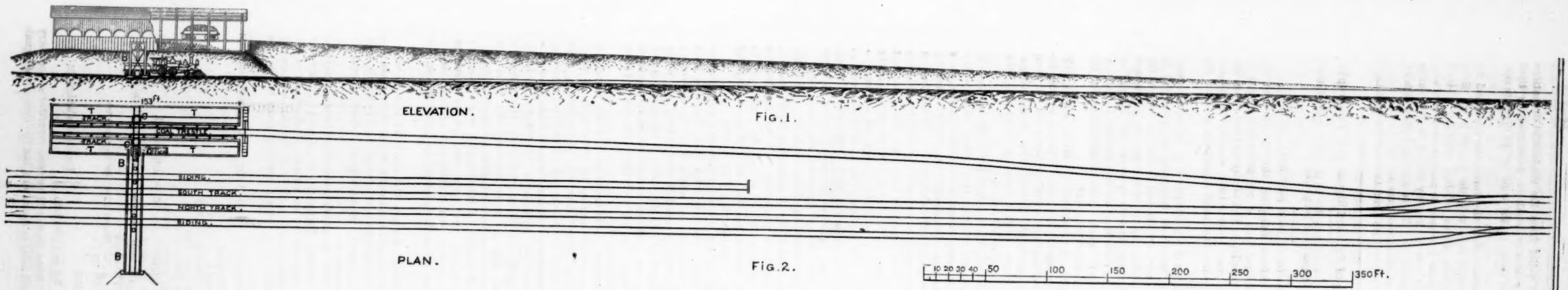


Fig. 1.

Fig. 2.

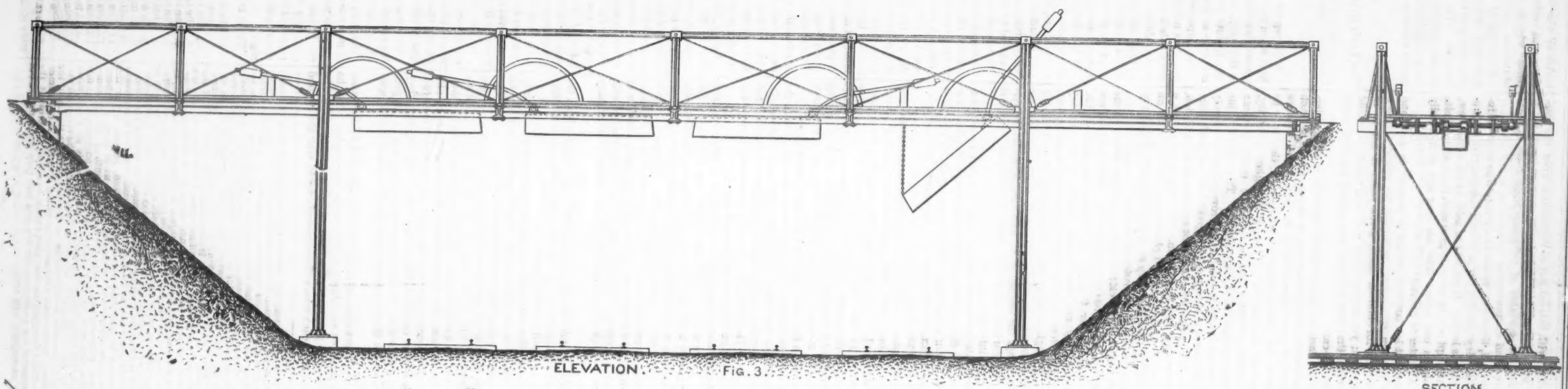


Fig. 3.

Fig. 5.

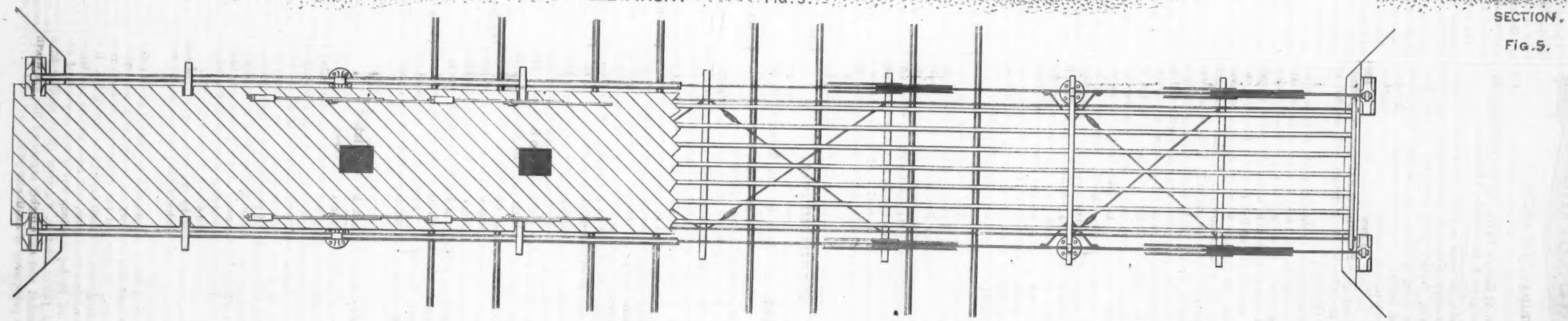


Fig. 4.

COALING STATION AT GRAY'S FERRY ON THE PHILADELPHIA, WILMINGTON & BALTIMORE RAILROAD.

Designed by S. T. Fuller, late Chief Engineer.

(*For description see page 693.*)

MODE OF FASTENING END JOISTS.

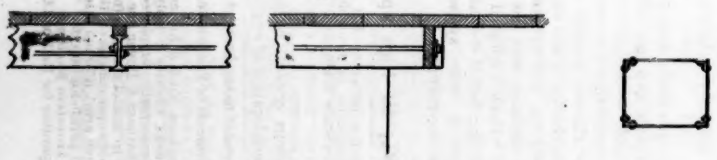


FIG. 6.

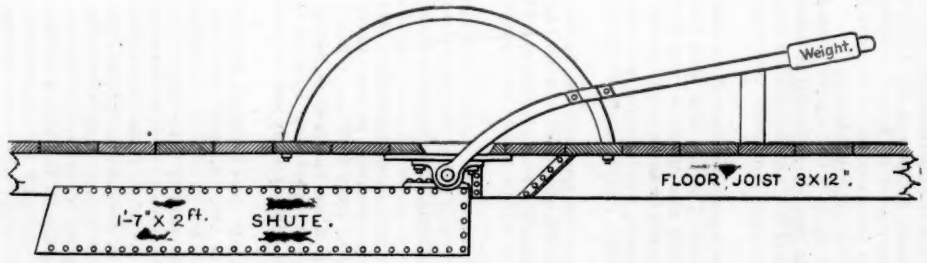


FIG. 7. SIDE VIEW.

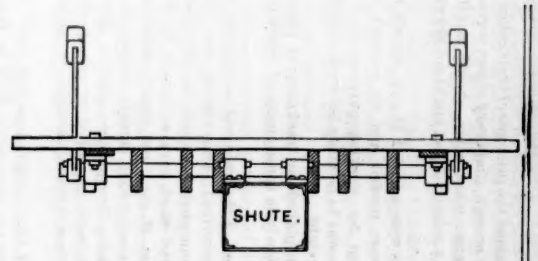


FIG. 8. END VIEW.

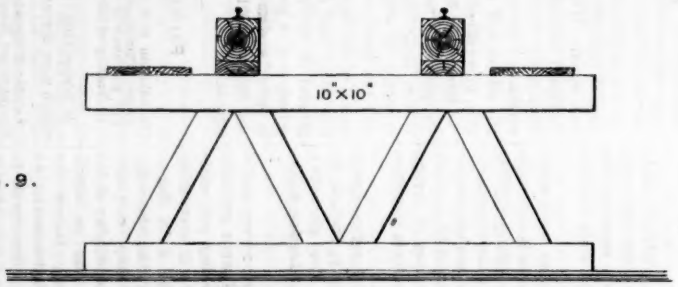


FIG. 9.

COAL TRESTLE AND TRACK.

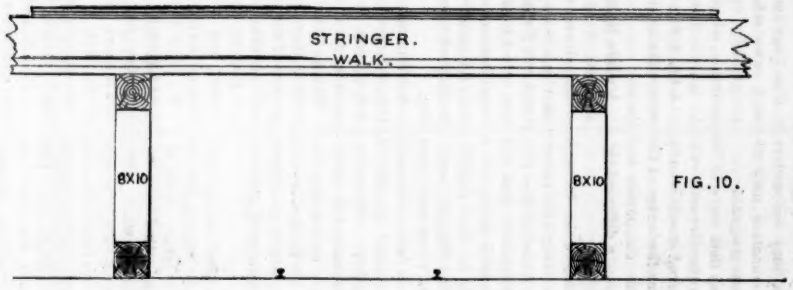
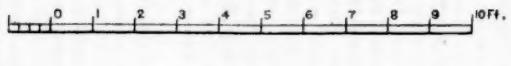
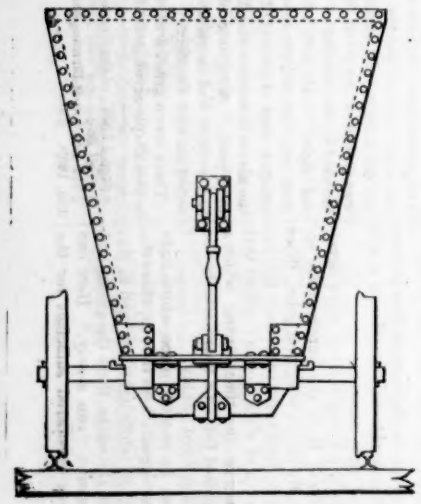


FIG. 10.

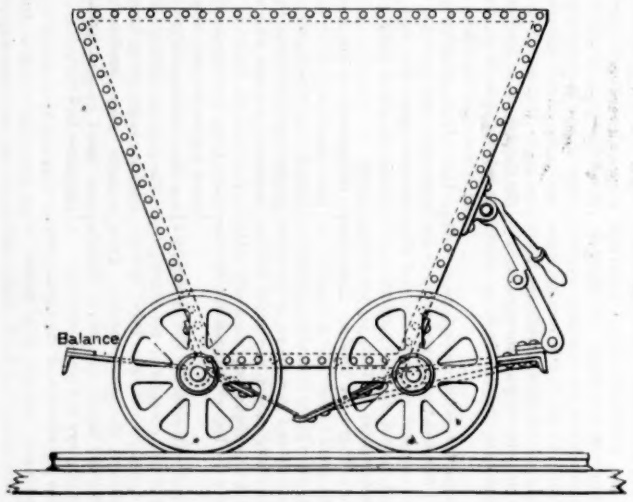
Scale for Figures 6, 7, 8, 9, 10.



PLAN OF COAL CAR.

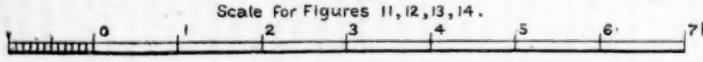


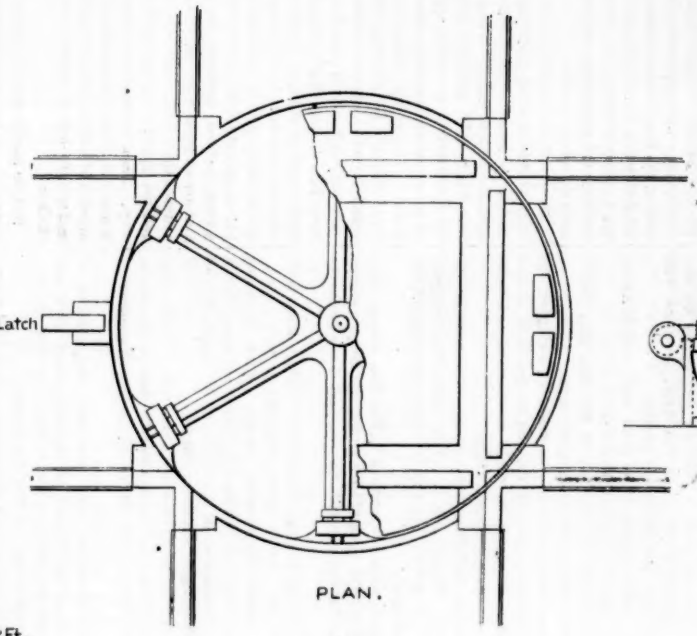
END.
FIG. 11.



SIDE.
FIG. 12.

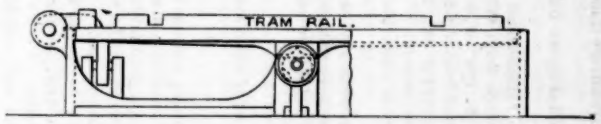
Scale for Figures 11, 12, 13, 14.





PLAN.
FIG. 13.

PLAN OF TURNTABLE COAL SHED.



SECTION AND SIDE ELEVATION.
FIG. 14.

DETAILS OF COALING STATION AT GRAY'S FERRY.

(For description see page 693.)

did not decrease in consequence, on the contrary it increased from year to year.

For instance, that signal book contained signals for

The train has stopped.

To mark the section to which a helper engine must go.

To mark the time at which an extra train will be dispatched, that were only included in few of the later books. Of signals that were transmitted from watchman to watchman, and which are to be regarded as "through signals," that signal book contained six, namely:

1. "Everything in order;" to be given when the watchmen had inspected their sections.

2. "The train has stopped;" when from any cause the train had stopped on the open road [between stations].

3. "The train is not coming;" should it be necessary to prevent a train's starting.

4. "A helper engine must be sent."

5. Designation of the section of road of which something is signaled.

6. To mark the time of an extra train.

We shall see directly how, in determining upon the form of these signals and allowing signs complicated beyond all practicability to pass through many hands, a great mistake was made as to the value of the different signals for railroad operation and the visibility of the different signs.

The means for signaling prescribed for use by the first signal book consisted of white and red flags, lanterns with white and red light, and the steam whistle.

To express these sixteen ideas with such simple means they had to be employed in the most varied ways.

As a matter of fact, the motion of the signaling object was very much employed in making the signs.

The signal for running slowly was made by swinging the flag by day, and at night by moving the red light up and down. The flag swung in a circle and the red and white lights shown alternately meant "stop."

This method of signaling was more important in the through signals. Thus: No. 1. "The train has stopped." The red flag held up steadily, and by night intermittent display of the red light.

No. 2. "The train is not coming." The flag swung in a circle and then held upright; by night, the lantern moved up and down, showing upwards the red and downwards the white light.

No. 3. "Auxiliary locomotive wanted." Flag held horizontally; by night, a white light swung in a circle.

"No. 4. "To show the number of the section on which an accident has occured." The flag raised as many times as will denote the number of the section; by night, the red light darkened an equal number of times.

No. 5. "Hour of departure of extra train." The flag turned downwards as many times as will denote the hour; by night, the white light darkened an equal number of times.

From the experience we have now had, the number of misunderstandings this system of signaling must give rise to will be plainly evident, and practice soon showed the uselessness of through signals of this description.

When, however, as has been shown above, from the experiments as to the form of the permanent signal apparatus which was to be furnished to each watchman, the above described had been certainly developed, the semaphore system, thus constructed, was adopted by all North German lines, which introduced throughout optical signals, while the South and West German lines, which also adopted through signals, mostly employed disks, baskets or balls, hoisted on masts, for transmitting them.

The form, color and construction of the semaphore, as well as the disks, etc., hoisted, differed naturally according to the opinions of the responsible engineer of each line and also according to the locality and custom, whereby, almost everywhere, the good old rules established by Chappe, respecting the visibility of bodies, were flagrantly broken. Here the semaphore arms were made small in size and perforated so as to show the background, there large compact semaphores were displayed, painted in gray and gay colors, or the color of the semaphore was carefully chosen according to the background against which it was displayed, frequently without considering how greatly the latter changed during the different seasons.

In one locality, disk-shaped extensions at the extremities of the semaphore arms were considered necessary; in another they were made angular, while in a third, strictly parallel forms were considered the most suitable. They were constructed of sheet iron, wood, iron-work, basket-work and as bars, venetian shutters and plane surfaces.

The difference between the signification of the signals was just as marked; what here meant "danger, stop" meant in another place "all right, line clear." Almost every sign was used to express every idea.

But if the through day signals on the various lines showed the most widely differing forms, this was the case to a still greater extent in the optical night signals.

These arrangements in railroad engineering were developed wholly without system. Here the lanterns were arranged to be hoisted vertically on the telegraph poles, there horizontal or special supports; here stationary, there moving lights were used; it was even at some points required that the signal man should observe the time during which a light ceased, when it was passed behind a board attached to the signal pole to cause intermittent display.

Here red, there green and in another place white light was used for the "all right" signal; here the red, there the green and in another place the white light was used to signal for "stop, danger;" here the white, there the green, and elsewhere the red light meant "run slowly." Here one light of changing color was considered sufficient for the transmission of the different signals; there two or three of the same color were combined; and at another point all three colors were used to produce the required signal.

As a rule only the ideas "a train is coming" (right and left), "a train is coming on the wrong track" (right and left), "the train is not coming," "auxiliary locomotive wanted" (right and left), "auxiliary locomotive may return," were communicated by through optical signals.

It thus came to pass that the eight ideas that have to be expressed by through signals appeared on the German railroads in 166 different forms,* and it occurred spontaneously to the thoughtful engineer, on turning over the leaves of the signal books of the different lines, that the companies had agreed for a joke that each one should invent a different signal and bring them all into practice.

Not the least mistake in the introduction of the through signal system and the construction of the telegraph apparatus destined for that purpose was to be found in the fact that it was all too cheaply made, and therefore was not strong and solid enough, and of a form scarcely fitting for a mechanical apparatus. They compared, in that respect, very much to their disadvantage with the English semaphores of similar form, to which we shall recur later, and which, made entirely of iron, solid in every part and working unaffected by the wind, made sure a proper display of the desired day or night signals in all weather. Therefore, the German telegraphs were in no wise fashioned in imitation of the English semaphores. And yet, inattentive engineers when traveling have even held the semaphores of the London, Chatham & Dover Railway, which resembled the German semaphore telegraphs, as imitations of the German signaling system.

These latter consisted mostly of wooden posts (often very tall), provided with climbing pegs, at the upper end of which the arms, which were often very large, were attached by loose joints. These arms were operated from below by loosely hanging wires. At the sides were wires stretched on iron or wooden spindles, between which, by means of loose chains, the night signal lanterns were hoisted up and down. To many telegraphs, moreover, arrangements were attached for hoisting balls, baskets, flags, etc. The whole forms an agglomeration of loose parts, which are not only subject to much disorder, but whose working, particularly in a violent storm, is highly problematical. Above all is the making of night signals uncertain, under these circumstances, especially when frost occurs. Then the lanterns, frequently very poorly constructed, have to be manipulated by the signal man with numb hands, and two and often three at a time hoisted between the loose wires to a great height, and are so shaken by the storm that on this account or because of the solidifying of the oil, one or more are extinguished and the signal thus changed is thus transmitted along its way. The consequence is, as every practical railroad man knows, and every honest one will acknowledge, that the transmission of *extraordinary* signals, even by day, is very slow and unsafe, but by night is *very seldom* successfully accomplished.

But, in addition to the dangers thus arising, there were others of a no less serious nature, consequent on the use of these huge awkward contrivances. Violent storms often broke down the strongest signal poles, particularly on the elevated plains where they rage most violently, and caused them to fall on the electric telegraph wire, or even on the rails. In one night (Dec. 31, 1862), on the fourteen (German) mile (66 English miles) long, Saxon-Silesian State Railroad alone, 21 poles of 10 to 16 in. diameter were thrown down, fortunately not upon the track.

The optical telegraphs other than the semaphore have such slight claims to the title of a really mechanically constructed apparatus that we may well spare ourselves the trouble of going further into the history of their development.

In England at the same time they went to work much more practically to secure first of all uniformity in the signification of the signals. Hardly had the railroad system attained any development, hardly had a few lines been constructed to connect with one another, hardly had they begun to feel that the interests of a proper utilization of capacity and rolling stock demanded the amalgamation of several lines, before the necessity of introducing uniform principles for the signaling system was recognized.

The principal railroad officers of England therefore agreed upon a conference at Birmingham in February, 1841, to determine these fundamental principles.† The discussion was based on the signaling system of the London & Birmingham Railway.

This was very simple.‡ The watchmen, who were posted at intervals of one to three English miles, were provided with red and white flags, and lanterns showing red, white and green lights. On the approach of a train, if everything was right on their section, they displayed the white flag or the white light. If caution was necessary, the white flag was waved or the green light displayed. "Stop" was commanded by the waving of the red flag or the display of the red light. At each station there was also an alarm that ran down whenever used. Shortly before the schedule time of arrival of each train, the station-master set the alarm in motion and this called all his subordinates to their posts. A register attached to it showed how often it had worked, and therefore whether the station-master had called his men together.

There was a great deal of ingenuity and clear-sightedness in this simple arrangement, and the conference could add but little thereto. They retained the principle of their colors,* but determined practically enough, that every object waved every light waved, no matter what color, should signify "caution" and "stop," as a colored object might not always be on hand.

Blue flags and blue lights were adopted as stop signals in such cases where stops were needed, not on account of irregularity or danger, but for working purposes, as, for example, when a stoppage was to be made between stations to take on passengers or freight.

A black flag was to be displayed by trackmen at places where trains should pass slowly in consequence of track repairs.

A white light at the front of the train and a red light at the rear were strictly prescribed; long sounds with the steam whistle were recommended as signals for the public (starting, warning, etc.), and short ones as signals to the employés (brakes on, brakes off, etc.), and finally, attention was called to the value of conspicuous signals, visible at a long distance, such at rockets, Bengal fires, cannon shots, etc., for cases where trains were compelled to remain stationary on open road (between stations) at night or during fog.

A comparison of many of these conclusions with those of the conference of experts held in September, 1865, at Dresden, plainly shows the oft-referred-to current of ideas respecting arrangements in the practice of railroad operation.

But, as the chief element of the English railroad signaling system, there was developed, at the commencement of the growth of the traffic, from the above described disks and signals operated directly by hand, the form of signal which has become the fundamental type of the English signaling system, and which has only lately received in Germany a little of the recognition that its importance deserves.

We refer to the "distant signal"‖ *i. e.*, a signal worked from a critical point, or spot that requires special attention in passing, and which is placed at a sufficient distance from such a point to allow the necessary precautions to be taken on the train.

The above-described signals consisted at first of the same disks, tablets or other objects,‡ as had until then been operated directly by hand, with this difference, that they were now operated from a station by an employé specially intrusted with their management, who by means of a wire, conducted over posts and rollers, turned, raised or lowered them.

Where it appeared necessary the apparatus was duplicated, so that it was possible, as the wires could be worked for a distance of 1,500 yards, to secure long stretches of road from one point by means of signals that at most passed through two to four hands.

In this manner not only were the stations protected against rear or butting collisions of trains, and long curved cuttings and tunnels, through which it was impossible to see, made secure, but it also became possible at great distances from a point where precautions or particular action on the part of the train employés were demanded, to issue authoritative orders to them from the point itself, and it finally became possible, by cutting off the intermediate stations and sections of road, to prevent the too close approach of trains to each other, which might possibly lead to great danger.

In these contrivances, and with good judgment, the number of signals was confined to two, "all clear" and "danger." As a general rule for the first signal there was adopted the position of the disk placed parallel to the track, and a white light by night; for the second signal, a position at right angles with the track, so that the locomotive engineer saw the full face of the disk by day and a red light by night. On this subject no difference of opinion occurred among the English engineers respecting the construction of their distant signal. When later (at first on the London & Dover Railway) semaphores were adopted,§ the arm extended horizontally always signified "stop, danger," when hanging vertically "all clear;" afterward, a third was very practically added, and inclined obliquely, which signified "caution, move slowly."

After a short but lively controversy among the experts on the question, "whether signals as a rule were to be placed at line clear," and only made to signal "stop" in cases of necessity; or whether the latter should be the usual position and the train was to be allowed passage only on the removal of the signal, on psychological and practical grounds the latter was determined on, and opinion was soon so general in favor of the decision, that not only was the principle of a permanent "block" adopted almost entirely in optical systems of signaling, but it was also afterwards the fundamental principle of most systems of electric signals.

(TO BE CONTINUED.)

* Signal books of the German railroads.

† *Civil Engineers' and Architect's Journal*, 1841, p. 3.

‡ The London & Birmingham Railway; by Thomas Roscoe, London, 1839. Tilt.

* Code of Signals recommended to be observed on all Railways Birmingham, March, 1841.

† Wild: "Working Arrangements of English Railroads." Stuttgart, 1848.

‡ On the London & Birmingham, York & Newcastle London & Berwick, Yarmouth & Holyhead, Chester & Holyhead and their branch lines, disks were universally employed. Semaphores were used on the London, Chatham & Dover line. On the Great Western Railway, according to Brunel's maxim (not to be entirely rejected)), that a signal should never consist of the absence of a signal (a sharp edge or lowered arm), a round disc was displayed for "stop" and an elongated parallelogram for "road clear."—*Notes of the Author during Travels in England.*

§ Paul Sick on English Apparatus for Railroad Operation.

Permanent Way for High Speed.

[Translation and summary of a paper by MM. A. Huberti, Engineer, Professor in the University of Brussels, and A. Flamachi, Engineer of the Belgian State Railroads, Professor in the University of Ghent.]

In comparing the numerous systems of permanent way which now demand the consideration of engineers, sufficient

attention is seldom given to the train-speed, which is really of paramount importance in deciding upon the type. We do not mean to say that no difference is made between local roads of small traffic and the great through lines over which run fast express trains; but that in studying one of the latter too little attention is given to the question whether trains are run over it at 35 to 40 miles an hour or at 55 to 60 miles. Yet an increase of 15 miles an hour in train-speed sufficiently increases the stresses to modify entirely the conditions of durability of a given line. It does not seem necessary to recall the fact that the centrifugal force increases as the square of the velocity, and that it is rarely exactly counterbalanced by the elevation of the outside rail; that the intensity of the lateral stresses increases in a marked degree with increase of speed, and disturbing causes acting with greater energy at a higher speed make the movement of the locomotive less regular. These truths are commonplace. Yet it is because they are forgotten that things which can have no relations to each other are compared, generalizations are made from results obtained under special conditions, and we adopt with confidence for lines destined to be used for high speeds systems of permanent way which have no other recommendation than that they have done well under quite other circumstances.

In what follows we shall seek the conditions to be fulfilled by a line adapted to high speeds; but we shall first eliminate from the consideration those systems which seem entirely unsuited for fast trains. One of these is the system of supporting the rails on longitudinal sleepers. We will briefly sum up the objections to this system. The surface resting upon the ballast is considerably less than with cross ties, hence a less uniform and favorable distribution of the pressure. The two lines of rails having no common support deflect unequally, causing serious oscillations at high speeds. The independence of the two lines of rails necessitates preserving the gauge by some device of struts and ties; but the variety of these devices shows that it is not easy to obviate this difficulty. This is the greatest defect of longitudinal sleepers, and is inherent in the system. Its bad effects may be mitigated by great care in maintenance, but they can never be entirely avoided. Moreover, as longitudinal sleepers offer a certain obstacle to the flow of water, draining the road-bed becomes more difficult, tamping must be more frequently done, and it is only with constant care that a good surface can be maintained. The longitudinal sleeper systems most in use are of German origin, and are the Hilf system, which is a variety of the system applied by M. Hohenegger on the northeastern lines of Austria; the Rhenish system; the Haarmann system, and the system of Serres & Battig. Seventy miles of the Hilf system have been applied on the Belgian state railroads, and it is found that under favorable circumstances it requires from twice as much to two and a half times as much care in maintenance as cross-ties.

On about 12,000 miles of the Prussian state railroads there are not less than 1,000 miles laid with longitudinal sleepers; but in Germany trains are run very slowly, and the results of experience there are not precisely applicable to this discussion. Probably we shall not be contradicted when we say that longitudinal sleepers should never be used on roads for heavy traffic and high speeds.

We have next to consider the system of transverse supports of metal. There are many devices of this sort, and, except in England, there are few companies that have not tried some of them. In most of these devices the Vautherin section has been used, and they differ only in minor details. The greatest objection to the general principle of metallic cross-ties is the lack of stability. This is due largely to the insufficient adhesion between the metal and the ballast. It is easy to see that by the pressure of the particles of the ballast into the wood the friction between wooden cross-ties and the ballast becomes one of the greatest causes of their lateral stability. To this cause of the instability of metallic cross-ties may be added their comparatively small weight. In fact, they rarely weigh more than 100 lbs. each, while the half-round oak tie of the Belgian state railroads weighs 132 lbs. and the squared ties of many roads weigh 155 to 165 lbs., and perhaps 175. This considerable difference of weight must have a decided effect on the stability of the track. The attachment of the rail to metallic cross-ties has not yet been well arranged. Finally, the laying of the rails to an increased gauge (as on curves) is made much more difficult. As to comparative durability of iron and wooden cross-ties, we have not yet data enough to determine the life of the iron tie.

It remains for us to consider track laid with wooden cross-ties. The two systems most generally employed are the Vignolles system (a T section) and double-headed rails laid in chairs. On the continent the Vignolles system is usually employed, although several important French lines keep the double-headed rail. In England, on the contrary, the double-headed rail is almost universally used; and considering that in England trains are run faster than anywhere else, and that the English constructors have tried carefully to find the best conditions of stability and endurance, this is an important fact. It is to be observed, however, that in England the cross-ties are always of pine, while on the continent oak and beech are generally used. But a soft wood requires a large base for the support of the rail and a considerable number of fastenings (screws, spikes, tree-nails, or whatever is used) connected with each other. Therefore the chair of the double-headed rail seems preferable for pine cross-ties, while the Vignolles rail section requires a tie of hard wood, and preferably oak. Whatever be the rail adopted, two conditions seem essential for a solid track—a strong rail-section, and closely spaced ties. These conditions conduce not only to durability but to stiffness; that is, to preserving that level surface so necessary to smooth running. Stiffness is considered among English engineers as of primary importance, and their rail sections are designed to secure it. Moreover, a strong rail section diminishes the danger of breakage of rails, and makes it possible to modify the cost of track by wide spacing of the ties. Close spacing of the ties increases the stiffness of the system by a good distribution of the pressure on the ballast, increases the resistance to over-turning a rail, and makes a more complete union between the two lines of rails.

It is not possible to determine absolutely the relation always to be maintained between rail section and distance between the ties. That depends, of course, upon prices of material and labor.

We will now consider more in detail the elements of a good track for high speeds, when laid with Vignolles [T] rails.

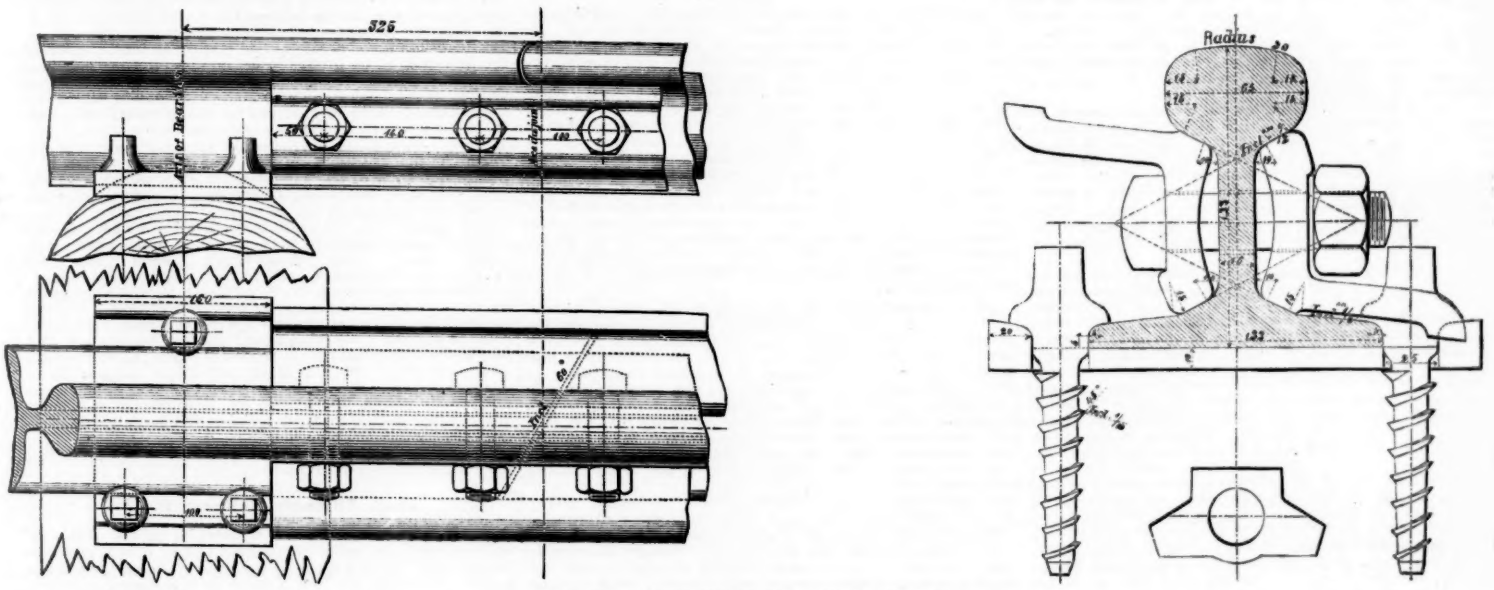
Beyond a doubt, steel is the proper material for the rail The section should be 80 to 85 lbs. per yard; the ties of oak, creosoted, spaced not more than 33 in. apart, centre to centre. It is a mistake to reduce the section of steel rails because of the greater strength of the metal. The exigencies of traffic are constantly increasing, and the strength of the rail must be kept up. To choose a light rail because it is sufficient for the demands of to-day and has as great strength as the iron rail which it replaces is to discount the future. The tendency is to make the width of the base of the rail less than the height of the section. It seems as if it would be advantageous to make the base at least as wide as the rail is high, to diminish the strain on the inside fastenings. Statical equilibrium is established, of course, when the resultant of the weight on the rail and of the horizontal strains falls within the base of the rail; but just what is the amount of the horizontal strains we cannot determine, and it is probable enough that the conditions of the equilibrium are often not fulfilled, and that the inside fastenings of the rail may be called upon to prevent its overturning. With a section of 85 lbs. to the yard it is easy to make such a distribution of the metal as will give the correct proportions.

On an oak tie the rail might be placed directly on the wood but for the desirability of having the fastenings united so that all of those in one tie shall act together to resist the lateral strains. To this end it is proper to use a plate under the rail. There is a marked advantage in arranging the fastenings in groups of threes, two on the inside of the rail, because this disposition best resists the effort to overturn the rail; while the plate makes all three available against lateral movement.

We will now consider the subject of the position of the joint and the style of fishing.

The constant experience of a great number of companies proves that the suspended joint has no disadvantages, but that it has many advantages which justify the preference accorded it. The motion is smoother than over supported joints, and the wear of the track sensibly less.

The design for a fish-joint given in the figures here with has a peculiar feature. The ends of the rails are cut at an angle of 60° with their long axes; which will probably give a smoother joint than the ordinary one. In fact it would only be necessary that 0.7 in. of the tire should bear upon the rail to cross an opening of 0.35 in. without a shock. At least, the experiment could be cheaply tried, for if it did not succeed the rails could be recut with little loss. Longitudinal displacement of the rails is made impossible by the flange of the fish-plate, which abuts against the plate on the tie. The flanged fish-plate used on many German roads has been adopted, but the outside plate has been placed with the flange up and the inside plate with the flange down. This arrangement is the most favorable to a good distribution of the material with regard to the strains to be endured. The rail is supposed to be supported upon 11 half-round oak ties, with 25½ in. between centres of ties at the joint and 10 intermediate spaces of 33 in. between centres. A track constructed according to the ideas here developed would be adapted to the highest speeds, and it would be comparable to the tracks of the great English lines.



RAIL-JOINT AND CHAIR FOR HIGH SPEEDS.

(Dimensions in millimetres.)

Table Showing Some Characteristics of Track.

Country.	Rails.			Ties.		
	Section.	Weight per yd.	Length.	Length.	Width.	Spacing.
		Lbs.	Ft. in.	Ft. in.	In.	In.
England	Double head.	77 to 85	22 0 to 27 0	9 0	10	31.5 to 32.0
Belgium	T	75	19 8 to 29 6	8 6	10.23	35.43 to 39.37
France	D. H. & T	76 to 78	18 0 to 36 0*	8 2 to 9 0	7.87 to 11.81	31.5 to 43.31
Germany	T	62 to 75	21 4 to 29 6	8 2	8.65 to 10.23	39.0 to 41.33
Netherlands	T	68 to 73	25 11 to 29 6	8 6	9.45 to 11.02	35.43 to 38.59

* Usually 26' 3".

NOTE.—The rails are generally steel. The ties are of pine in England, oak and pine in Belgium, oak and beech in France, oak pine, or iron in Germany, oak in the Netherlands

The Abolition of Ticket Commissions.

Mr. W. H. Dixon, Commissioner of the Western Trunk Lines Association, has issued (but not in his capacity as an officer of that Association) a circular in which he publishes plans for bringing about the abolition of ticket commissions proposed in his circular of Nov. 1, which he prefaces by the following remarks:

"My circular of Nov. 1, 1881, was sent to all important railroad lines in the United States and Canadas, and I have received responses from nearly all of them. The preponderance of sentiment is strongly in favor of an immediate effort at reform, and so earnest are some of the gentlemen that they have favored me with papers on the subject, together with plans and agreements to effectually carry it out. These papers were all written by prominent railway men, located

in different parts of the country, without concert or consultation, and are therefore remarkable for their close approximation to unanimity of opinion as to what is the proper method or reform. They are submitted for your consideration, in the hope that they may aid you in determining to unite with the 'reformers' on some one of the plans proposed, or perhaps suggest to you a still more practicable method of dealing with the problem."

Mr. Dixon, in accordance with the wishes of the majority of those answering his circular, has called a meeting to consider this subject, to be held at the Grand Pacific Hotel, Chicago, Thursday, Dec. 15, beginning at 11 a. m., at which it it hoped that every line in this country will be represented.

The papers published in Mr. Dixon's circular are all well worth consideration, but lack of room compels us to select the following only for reproduction:

FROM A MANAGING OFFICER FAVORING RADICAL REFORM BY PROHIBITING PAYMENT OF COMMISSIONS.

Abuses that, by their age, have become almost as firmly established as legitimate practice, can be eliminated only by the most radical of measures. By the long continued practice of paying, and by the long unchecked ability to receive commissions, the paying roads and the receiving agents have managed to dispose of vast amounts of the revenue derived from passenger earnings, and have thus despoiled the owners of the railroad property, or have assisted in forcing the passenger to pay much larger rates for his railroad passage than he would have been obliged to pay had no commissions been paid by railroad companies or received by railroad ticket agents; for had not commissions been paid, the owners of the property would have received much larger earnings from their property, as the commissions paid by the leading railroads amount to from one to three per cent. of the gross revenue derived from passenger earnings. Or if the owners of the property had not been paid increased dividends, from the money that would have been saved if commissions had not been paid, then the railroad companies would have been able to quite largely reduce their passenger rates, as the amount paid for commissions, if saved, would allow the companies to pay as large dividends on the property as have been paid in the past, and yet reduce their passenger rates to a considerable and appreciable extent. I think the through rates could readily be reduced from five to ten per cent. from the savings in commissions alone, since the amount paid as commissions aggregates fully that percentage on all competitive business.

Now as the paying of commissions is acknowledged by almost every railroad manager to be an utterly unnecessary, unwise and inexcusable abuse, and one that should be utterly "wiped out of existence," and as I believe this can be done alone by the most radical of measures, I would, therefore, submit the following as a contract that shall be agreed to and signed by the managing officer of every railroad company, that agrees with me as to the character of the abuse, and the need of its abrogation and final extinguishment.

Agreement.—The undersigned, for himself and for the railroad company he represents, hereby promises and agrees that from and after Jan. 1, 1882, he will not for himself, for the railroad company he represents, or for any other person, corporation or company, pay or caused to be paid to any railroad ticket agent, or to any person for any railroad ticket agent—saving alone the ticket agents employed by him or his company to sell the regular tickets prepared, printed and issued by his company, and which are sold in the public and regularly authorized ticket offices of his company—any commissions, presents, "side-cuts," rewards or remuneration whatever, in any manner or form, directly or indirectly, or in any other way, for any real or pretended service in connection with the sale of railroad tickets issued by said railroad company and other than the one he represents—or for any real or pretended service connected with the advertising of his road, or any portion of it, or the procurement of passenger business for his road, or any part of it, in the future or in the past; and the undersigned, for himself and for his company, pledges himself to summarily dismiss from the service of his company any officer or employé of his company who is shown to have violated this agreement in any manner or form. He also hereby pledges himself, and the company he represents, that he will not, after Jan. 1, 1882, sign any voucher, bill or order by or on which the treasurer, cashier or disbursing officer of his company can pay out any money or evidence of value in violation of any part of this agreement, on any business or for any real or pretended service that may be rendered, or that may be alleged to be rendered after said Jan. 1, 1882.

"So that all railroads parties hereto shall know what persons are regularly in the pay of the companies parties hereto, and so that no ticket agent shall be paid commissions under the pretense that he is paid a salary for other services, the undersigned, for himself and for the railroad he represents promises, after Jan. 1, 1882, to furnish to the general manager or to the general passenger agent of any of the railroad companies parties hereto, who may request the same in writing, a full list of all persons—saving persons employed in the regular ticket offices of his own railroad—who are paid any form of salary by, or on account of, the passenger department of the road he represents. This list shall give full details as to the position held by the person so paid, his location and for what form of service he is paid. The undersigned also promises and agrees not to pay for himself, for his road or for any person, company or corporation, or allow to be paid by any person for or on account of the passenger department of his road, any "side-cuts" or any other form of remuneration, saving by or through the head of the passenger department. This shall include all sums paid on account of the passenger department to all persons living or working off the lines of the roads operated, controlled or represented by the undersigned.

"The names and addresses of all general agents, traveling agents, advertising agents, bill posters, bill distributors, passenger agents, passenger solicitors and all other persons working under the orders of the head of the passenger department, saving those employed on the lines operated, controlled or represented by the undersigned, shall be printed on such portions of the company's advertising matter as is posted, used or distributed by said persons variously designated above."

If the above agreement, or one of similar import, is signed or put in effect by the managing officers of our respective roads, we shall, by your meeting, relieve our roads of a matter that is now not only a burden to our companies, but that has become a byword and disgrace to the whole American railroad world.

I have made the above agreement so broad that I believe it covers all possible points needed to reach the desired end. I have drawn up the above agreement so that you will have it ready for your meeting, as I have always found that when we meet we are generally in too much of a hurry to thoroughly digest any agreements that are presented at our meetings. I think it would be well to print this agreement and present it to the parties interested.

I trust that your meeting means business, and that no managing officer will be too timid to go into this much-needed reform. In a long series of years of railroad management I have yet to find more than two persons who have attempted to justify the payment of commissions, and I am happy to say that both of these persons are known to be men who have no regard for their company's financial welfare, and who never give a thought to the real results that follow from the payment of commissions. They have absorbed the foolish notion that by paying commissions their positions with ticket agents are exalted, and that they thereby attain to a reputation that they could get in no other way.

FROM A GENERAL PASSENGER AGENT FAVORING REFORM BY PROHIBITING THE RECEIVING OF COMMISSIONS.

Prohibit your own ticket agents from receiving any commissions or other forms of remuneration from other railroads before you attempt to control the ticket agents of other roads, and attempt to induce other railroad managers to stop paying commissions.

At the first glance at this plan, it doubtless will be thought to be worthless, and to be impotent to effect any reform in the commission question. If it is carefully examined, I believe it will not only be found worthy of thought, but will be found to be entirely efficient, and that if adopted will not only end the commission dilemma, but will also prevent undue discriminations in the sales of tickets by ticket agents.

Railroads desire the sales of their tickets to be conducted on a natural basis; to give to their various connections a fair and just share of their business; to prevent their ticket agents from discriminating in favor of one road because it pays commissions; to prevent their ticket agents from discriminating against another road because it does not pay.

Our ticket agents are *very* human, and as we are all working for dollars and cents, we can hardly blame them for working for roads that pay them, and against roads that do not pay. If we allow them to take commissions from one road, and do not force all roads to pay them, we must expect them to discriminate in favor of the paying road; and as we all desire our ticket agents to work neutrally, it seems to me that we must prohibit them from receiving any commission or other form of remuneration from any railroad or corporation, or from any person, saving only from the road whose ticket agent he is publicly acknowledged to be.

Railroads are at great expense in engaging general ticket agents to prepare tickets, blanks, reports, books, etc., for the issuance, sale, custody, reporting and auditing of tickets and ticket sales; they keep large forces of clerks employed in arranging, assorting and adjusting tickets and ticket accounts; buy tickets, ticket cases and the customary outfit of ticket offices; place in charge high-priced and competent ticket agents, and thus expend many thousands of dollars annually, principally to please its connections and with the full determination to give all of those connections a "fair show," and no undue favor; and yet in the face of this determination, they allow their ticket agents to be induced to undo one of the most important objects attempted to be obtained by the managers when they consented to issue coupon tickets; namely, allowing the ticket agent to be placed under obligations by gifts of money by one railroad, while he is not similarly paid by all of the railroads over which his tickets read.

If you would have your ticket agent absolutely neutral, and would prevent discriminations, you must make him the employé of your company *alone*, and not allow him to be paid by any other company or person for any real or pretended service done, promised or assumed to be done, as your ticket agent. It may be urged that you cannot pay your ticket agents a salary commensurate with their duties or responsibilities; you must allow me to say that this is a very poor excuse; nay, it is a disgraceful one to be made by any company that has gone to the expense of fitting out coupon-ticket offices; and is one that should not weigh an atom in this discussion. If you cannot pay your coupon-ticket agents as much salary as you think they can earn, then close up your coupon offices, and sell only local tickets, which can be handled by much cheaper agents than are generally engaged as coupon-ticket agents. You certainly cannot have any need for coupon agents unless you can afford to pay them without asking your connections to do so indirectly by bribery or commissions. We feel sure that managers cannot have taken this view of the case, or they would long ago have prohibited their ticket agents from receiving any commissions. They might just as well allow their general ticket agent to accept pay from competing or connecting roads, or their trainmen from connecting roads. It is a vicious system that permits the employés of any company to accept fees from any other company, and is fairly on a par with allowing the hotel waiter, or other hotel servant, or the employés in our public offices, to demand fees before they will do the duty they are paid to do by those in whose regular service they are. We are often amazed when we consider how any honorable ticket agent will allow himself to be bribed by accepting a commission, when he would scorn a bribe if it came in any other form. Worse even is his position when he accepts my money and immediately that of my competitor, when he knows that he earns neither.

If you will prohibit your agents from receiving commissions, you can demand and enforce neutrality toward your connections. It may be urged that it will be difficult to prevent an agent from taking commissions even when he has, by his general manager, been prohibited from doing so. It will not be difficult to detect him if you wish to do so. The reports of his coupon-ticket sales will generally prove or disprove the alleged fact. The traveling agents of non-paying roads will be persistent observers of his movements. With your prohibition, you must, for its violation, promise and enforce dismissal of the offender, no matter how valued an employé he may be. Scarcely any coupon-ticket agent would care to jeopardize his position simply for the sake of a surreptitiously paid commission. He would look with deserved suspicion on a man that offered him a commission, as he would have good reason to believe that the temptation was a bid for his dismissal, or perhaps a decoy set for his fall. This plan will allow agents of non-prohibiting roads to accept all commissions tendered, and will thus allow all competitors for that road's business to pay their agents if they so desire. It is believed that very soon all roads would issue the prohibition against receiving, for they would soon find that non-accepting agents were giving them better satisfaction than accepting agents could, and that consequently the connections of the prohibiting roads were getting fair treatment, and that the complaints of discrimination had ceased, or had been remedied.

This plan does not really require any concert of action, as any road can undertake it without the association of any other, and is merely simple justice to its connections. It may not be generally known, but it is a fact, nevertheless, that for years the Pennsylvania, Central Pacific, Chicago & Northwestern, Union Pacific, Green Bay & Minnesota, Georgia, New York Central, Grand Trunk, Grand Rapids & Indiana, and possibly other roads, have prohibited their agents from accepting any form of gratuity or commission, and that some of them have discharged ticket agents for violations of the order. It is well known that others of these roads have not enforced the order simply because their immediate competitors not only allowed their agents to take the commission, but actually forced them to take it, so as to divide what they thus received with passengers to whom they sold tickets, and thus to indirectly cut the agreed rates, and because the prohibiting roads were themselves paying commissions to the prohibited agents of other roads, and consequently they winked at the violation, on the part of their own agents, of their own rule.

It were much better to meet the indirect cut of rates named above by direct cuts, and thus publicly reduce rates, than to force connecting lines to expend their money and have it merely aid the receiving agent to assist his road in stealing business from its competitors. The ticket agent, in these cases, either gets no benefit from the commission, or he deceives his company by making it believe he divides the commission he receives, while he keeps it all himself. An agent that will do that is not worthy of being intrusted with his company's money, and is pretty certain, sooner or later, to leave it "between two days."

We believe the great majority of ticket agents to be honorable, order-obeying men, and if they were assured by their managers that they firmly intended to carry out in good faith their prohibition against receiving commissions, and to inflict the penalty for its violation, very few would be found to disobey, and a very much less number would have to be dismissed. If your ticket agent know that you are in earnest, they know that you can detect violations, and they will not give you the occasion to try to do so.

If you do not wish to be forced to pay commissions, this plan will nearly or entirely relieve you from doing so. If you do not wish to be continually tormented with charges of discrimination on the part of your agents, and if you do not wish your agents to be the paid employés of your connections, this plan will absolutely and entirely relieve you. If you wish to meet your competitors and pay commissions to whomsoever he pays, this plan will allow you to do so without the violation of your agreements or the violation of anything saving consistency, as it would seem to violate that by prohibiting your agents from taking commissions while you were paying commissions to agents of your connections. It may be urged that you would be forced to allow your agents, located at points occupied in common with your line and that of a non-prohibiting road, to receive commissions. To this objection we would say that you could have but one object in allowing your agent to take the commission, and that would be to force him to divide his commission with the passenger, or perhaps give it all to the passenger. As we have before hinted you could readily prevent this sort of work by giving your non-prohibiting neighbor due notice that if its agent did not cease thus to use the commission he received you would make your public rate equal to the cut rate indirectly offered by your competitor's agent. It cannot be urged that such work is not rate cutting. It undoubtedly is, as far as the passenger knows or cares, and it is to control that passenger against your company that a portion or the whole of the commission is surrendered. In the same way when your competitor openly or secretly cuts the agreed rate it is simply for the purpose of controlling the passenger against you. It seems to us that the owners of the property that is intrusted to you would much rather you would meet your competitor's secret cuts by open and public measures, and force him to keep his engagement rather than force your connections to furnish your agent money with which to meet your own competition. Having suggested or met all arguments against this plan that have come to our mind, we submit the following agreement, and believe it contains all that is needed to make the plan an absolute success. Should other objections suggest themselves to you, we would be glad to have you report them to Mr. Dixon, so that they can be answered, if answerable, at the meeting that will undoubtedly be called to consider the commission question.

[The accompanying agreement provides in precise terms for what is recommended above.]

Does Through Business Pay?

In view of the bearing of this question on the policy of railroads and the value of railroad stocks, it is a very important one. At this moment the state of Massachusetts has a great interest in the New York & New England railroad, which, as the *Republican* has always held would be the case, proves to have been laid across a barren heath so far as its local business is concerned, and as well as concerning the coal business between the Hudson and Boston, a business which would follow the water, even if the road were not intersected by lines up the Naugatuck, the Connecticut, the Thames and Narragansett Bay. But now Mr. Gould is said to have cast his eye upon this property with the idea of making it, not merely a road for Connecticut towns or even "the great coal road" of which we have heard so much, but the tip-end and Boston snapper, as it were, of his great transcontinental line. Very good; this is Mr. Gould's privilege as a millionaire, but many people are interested to know whether this will make the stock and bonds of the road worth any more. The capital stock consists of the old Berdell mortgage for $20,000,000, paying no dividends and quoted at 60 or 70, and there is also a funded and floating debt of about $11,800,000. The net income of the road this year was about $750,000, which will just about meet the interest on its debt. Now, the question is, can this road, without a great and profitable reservoir of local business, make such a profit from a great through business, furnished by Jay Gould or any other man, as to enable it to divide any profits upon $20,000,000 of capital over and above its fixed charges? This is an important question at least for the state of Massachusetts and for the stockholders.

There is another large body of the public interested in this problem. The old Southern road [the New York, New Haven and Hartford] from Springfield to New York, one of the few invariable 10 per cent roads of the country for many years, has been invited to lease itself to this New York & New England, as controlled by the new syndicate of Jay Gould, Cyrus W. Field and Russell Sage. That at least is the report. At all events, parties have had their eye on the Southern road with a view to leasing it for "a great through business." The stockholders of this property are quite a community in themselves. They have seen their stock outrank all New England roads in the quotations of its value and in its profitableness, or if one has been a late buyer, he has paid for a premium which adverse circumstances may momentarily destroy. These people are interested, therefore, to know whether through business pays and will pay either the New York & New England or the New York, New Haven & Hartford, which unlike the other has a rich local business to depend upon. But a vast public, who are not stockholders of either road, are interested as passengers. The Southern is and will be probably for many years the favorite New England thoroughfare to New York. The riding public demand of it such a policy as shall cheapen local fares and freights to the lowest figure compatible with their transportation in certainty, celerity and security. Speaking for that public, we may say that they do not care how much or how little wheat and cotton the road carries between the West and the South and Liverpool, but they do want cheap fares and freights to New York, and they deem this service the first business of the road.

The only grounds for judgment in a question involving so

many contingencies and so wide a range of possibilities are those of experience. We have in New England one road doing a great through business, and also an immense local traffic. The Boston & Albany, by its location and its function as the chief feeder of Boston, has undertaken and has done an immense traffic between the West and the East for exportation. It had no choice but to do this work. Boston demanded it, but did not invest in it very heavily. The Southern road has no such call, and has not till within a year or two had an ambition in this direction. A comparison of the business of these two roads during the epoch of this great through business may therefore be instructive. In 1873, the Southern road is first reported as a consolidated road. About the same time began the growth of Boston as a port of exportation of Western products, a growth which was stimulated by the Boston & Albany and s largely its own work. This growth is indicated by the following comparisons:

Exports from Boston.	1873.	1880.
Indian corn, bushels	947,584	8,412,913
Corn meal, barrels	72,422	136.941
Wheat, bushels	176,865	3,678.479
Flour, barrels	171 504	681.241
Bacon and hams, pounds	89,807,565	134,395,775
Butter, pounds	399,916	6,713,096
Cheese, "	795,595	4,335,502
Lard, "	14,546.066	47,997,462
Pork, "	6,627,139	26,233,357

Surely if there is a bonanza in the great through business, the Boston & Albany Railroad ought to have found it. Here is the business of that corporation from 1873 to the present year:

Boston & Albany.	Gross earnings.	Net earnings.
1873	$9,807,071	$2,218,911
1874	9,009,821	2,397,110
1875	7,949,667	2,507,514
1876	7,074,758	2,319,764
1877	6,780,597	2,096,581
1878	6,633,533	2,144,536
1879	6,427,463	2,703,638
1880	7,741,118	2,492,618
1881	7,875,285	2,186,873

Here is the record of the Southern road for the same period, barring the present year:

N. Y., N. H. & H.	Gross earnings.	Net earnings.
1873	$4,701,235	$1,809,971
1874	4,402,074	1,797,361
1875	4,599,523	1,872,125
1876	4,314,682	1.740,671
1877	3,954,060	1,731,683
1878	3,852,982	1.554,489
1879	3,933.595	1,691.659
1880	4,294,235	1,694,985

In other words, while the receipts of the Boston & Albany are $2,000,000 short of what they were in 1873, those of the Southern road are only $400,000 short. In 1873 the Boston & Albany got $6,221,000 for carrying 2,884,000 tons of freight; this year it gets $4,328,000 for carrying 3,593,000 tons. In 1873 the Southern road got $1,468,000 from its freight business; in 1880 it derived $1,651,000 from the same branch of its service, a positive increase in revenue. In 1876 the Boston & Albany road paid its last semi-annual dividend of 5 per cent.

These figures show conclusively that a well-cultivated local traffic is a much more certain source of revenue, is less open to competition and less affected by commercial depression than a great through business. They hint pretty strongly that if the Southern road accepts the mission of a great through line the rich profits of its local business will be required to make up the losses on its new acquisition, instead of being remitted to the public in reduction of freights and fares. Reductions of local rates tend directly to the increase of business, and if the Southern road wants to do more business for the same money, all it has to do is to tap lower reservoirs of travel by reducing rates. Its own experience has abundantly taught this. There may be other motives to induce a great railroad corporation to undertake a barren traffic. It may be the whim of some stockholder, holding a despotic majority of the capital; it may be the ambition of some community or state interested or the necessity laid upon every common carrier to carry what is offered. But the ruling motive of every railroad corporation which is governed by natural and normal causes should be to make a fair profit for the stockholders and to serve and build up the community with which it is environed, whose prosperity is its own sure and direct interest.—*Springfield (Mass.) Republican.*

RAILROAD LAW.

The Mellon Patent for Fastening Tires.

The Eastern Railroad Association has issued a statement in relation to the suit of Edward Mellon and Wm. Matthews against the Lehigh Valley Co., which says:

"The members of the Association, and all other railroad companies interested in such matters, will be pleased to learn that our defense of the Lehigh Valley Railroad Co. against the claim made for alleged infringement of letters-patent No. 58,447, granted to Edward Mellon, Oct. 2, 1866, for an improvement in the mode of attaching tires to the wheels of locomotives, has reached a successful termination on appeal to the Supreme Court of the United States.

"It was claimed that all steel tires put on to the wheel centres, with a flange to prevent lateral movement of the tire, infringed the patent. Our defense was that the patent was not so broad as claimed, and that the method of attaching tires, claimed to be covered by the patent, was known and used prior to the date of Mr. Mellon's alleged invention.

"In the Circuit Court the decision was against us. The patent was declared to be valid, and to be infringed by the defendants.

"The case was argued at the present term of the Supreme Court, and we now have the decision of that court of last resort, which *reverses* the former decision, and orders the suit to be *dismissed*."

The decision of the Supreme Court, which is appended to the statement, is against the patentee on the following grounds:

1. The invention claimed was anticipated in a patent granted to Nehemiah Hodge, Nov. 18, 1851, which shows precisely the contrivance described in the first specification of Mellon's patent.

2. Mellon's patent claim really covers only a flange with a curved or rounded corner, and he is precluded from claiming relief against a flange with a square corner.

3. The charge of infringement of his claim is not supported by the evidence; the proof adduced by the company is conclusive to show that the rounded-corner flange was not used and there was no infringement of the patent.

Liability for Patent Royalty.

The first business introduced in the United States Senate at the opening of the session last Monday was a resolution submitted by Mr. Ferry, of Michigan, instructing the Committee on Patents to consider and report by bill or otherwise such proposed legislation as shall effectually protect all innocent purchasers and users of any device, invention or article patented under the laws of the United States from the payment of or obligation to pay any royalty for such purchase or use of any patented article abandoned to public or general use by the inventor or patentee thereof, or from the payment of any royalty for such purchase or use of any patented article whatever, unless claim therefor shall formally be made and presented by the inventor or patentee to the purchaser or user of the same within two years after such purchase or first use of the device or article so claimed to have been duly patented. The resolution was laid over for one day under the rule.

South Carolina Railroad Law.

A bill is now pending in the South Carolina Legislature which is a general law providing for the organization of railroad companies, and also for their reorganization, consolidation, etc. Like most of the Southern states, South Carolina has now no general railroad law.

The bill also provides for a board of three railroad commissioners with more extensive powers than the present commissioner.

THE SCRAP HEAP.

Locomotive Building.

The three locomotive shops in Paterson, N. J., turned out 40 locomotives in November, the Rogers Works shipping 28, the Danforth Works nine and the Grant Works eight.

The Rhode Island Locomotive Works in Providence have a contract to build 50 eight-wheel freight engines for the Chicago, Milwaukee & St. Paul road.

Wm. E. Tanner & Co., of Richmond, Va., have bought a tract of land adjoining the Chesapeake & Ohio road in the suburbs of that city, where they intend to put up large shops, and to add the manufacture of locomotives to that of stationary engines and other machinery.

The Mason Machine Works, at Taunton, Mass., are building several heavy passenger engines for the Fitchburg Railroad.

The Taunton Locomotive Works, at Taunton, Mass., have recently turned out a number of freight engines for the Chicago & Northwestern road.

The Schenectady Locomotive Works in Schenectady, N. Y., have 10 engines to build for the Chicago, Milwaukee & St. Paul road, five of them to be passenger engines with 5½ ft. drivers, and five shifting engines.

The Portland Co. at Portland, Me., are building several engines for the Canadian Pacific road.

A paragraph has been going the rounds of the papers purporting to give the capacity of the various locomotive works of the United States. It has evidently been made up by some one who knew nothing about the matter, and it would hardly be possible to make a more incorrect statement. As an example, the Rogers and Mason shops are omitted altogether, and the Portland Company is put down at 250 a year!

An exchange speaks of the Canadian Engine & Machine Works at Montreal, the Canadian Locomotive Co. at Kingston, and the Canadian Locomotive & Engine Co. at Montreal—thus multiplying by three the single Canadian locomotive-building concern, the Canadian Locomotive & Engine Co., which has its shops at Kingston and its financial headquarters at Montreal.

Car Notes.

The Columbia Car Spring Company, of New York, received the medal of excellence for its exhibit of Hebbard, elliptic, volute, round-bar, edge-rolled and other car and locomotive springs at the late fair of the American Institute in New York. The company also received the silver medal for its exhibit at the Cincinnati Exhibition.

Mr. Tremaine, a conductor on the Chicago, Milwaukee & St. Paul road, has devised a new brake which is now being put on a new passenger train on that road for trial. It is intended to prevent the sliding and consequent flattening of wheels. The improvement consists in putting a heavy elliptic spring behind the brake-shoe.

The Peninsular Car Works in Detroit are building 200 coal cars 28 ft. long, to carry 20 tons each, for the Chicago & Northwestern road.

The St. Paul & Duluth shops in St. Paul, Minn., have lately completed 50 new flat cars.

The Wells & French Co. in Chicago are building 400 box, 100 stock and 100 coal cars for the Atchison, Topeka & Santa Fe; 250 coal cars for the Chicago, Burlington & Quincy and a number of cars for the Mexican Central.

The Union Pacific is building at Green Island, Neb., a car shop 200 by 350 ft., a wood-working shop 100 by 250, a paint shop 100 by 300, a locomotive machine shop 100 by 150, and a blacksmith shop with 48 fires. The buildings are of stone, with slate roofs, and are contracted to be finished by the first of January next. The road has recently ordered of the Pullman Co. six passenger cars for the Julesburg short line to Denver, and six for the main line.—*National Car-Builder.*

The Chicago Car Axle Co. has added a Willard patent steam helve hammer to its plant.

The officers of the Barney & Smith Manufacturing Co. at Dayton, O., are now as follows: E. J. Barney, President; J. D. Platt, Vice-President and Treasurer; F. E. Smith, Secretary; T. A. Bissell, Superintendent; Edward E. Barney, Assistant Superintendent.

The Laconia Car Co., at Laconia, N. H., has several orders for cars on hand, and is also making the trucks and iron-work for a lot of freight cars, which are to be sent to Florida, where the wood-work will be done.

The new car works of John L. Gill, Jr., in Pittsburgh, are now at work. His establishment can turn out five freight cars a day.

Bridge Notes.

The Leighton Bridge Works in Rochester, N. Y., are building an iron bridge of two spans at Carrolton, Pa., for the Rochester & Pittsburgh road.

Iron and Manufacturing Notes.

Messrs. Heller & Brightly have removed their manufactory of surveying instruments from its former location, at No. 33 North Seventh street, to their new factory, on the southeast corner of Spring Garden and Ridge avenues, in Philadelphia.

A company has been formed to manufacture the Scofield patent iron cross tie, and a few have been made at the rolling mill in Wyandotte, Mich. Arrangements are being made to turn them out on a large scale.

Alabama Furnace, at Talladega, Ala., and the Clifton iron property, consisting of about 12,000 acres of land, have been sold for about $250,000 to Samuel Noble, Horace Ware and others, who are stockholders in the Woodstock Iron Co. It is said that the purchasers intend to build another furnace and to establish steel works.

Paulding Furnace, at Cecil, O., was recently destroyed by fire. It was a charcoal furnace, owned by Graff, Bennett & Co., of Pittsburgh.

The new mill for rolling steel rails at the Washburn Iron Works in Worcester, Mass., is nearly ready for use.

The Co-operative Rolling Mill, in Danville, Pa., is turning out steel rails.

The Cuyahoga Works in Cleveland, O., are building a large rolling-mill engine for the Akron Iron Co., and have lately finished three large blowing engines for the Central Iron Works in Cleveland.

The Queen City Forge Co. is building new steam forge works in Cincinnati.

The rolling mill of Fowler & Sellers in Chicago is to be doubled in size, contracts having been let for new buildings and machinery.

The Rail Market.

Steel rails are quiet, with some inquiries but no new business reported. Quotations continue at $60 to $62.50 per ton at mill. Foreign steel rails are quoted at $63 to $65 at port.

Iron rails are more active, and are quoted at $47.50 to $48 per ton at mill for heavy rails, $49 to $53 for light sections. Foreign rails, $46 to $47 in New York.

Spikes continue at $3.15 per 100 lbs.; fish-plates, $2.60; track-bolts and nuts, $3.25 to $4.

Steel blooms are quiet at about $46 per ton, duty paid, with only light sales reported.

Old iron rails are higher, but sales are very slow. As high as $30 per ton has been asked in Philadelphia for tees, but buyers hesitate at that price.

Strength of Wooden Columns.

During a few days past a series of experiments has been conducted on the testing machine at the Watertown Arsenal by Prof. Lanza, of the Department of Mechanical Instruction of the Institute of Technology. The object in view was to ascertain the strength of wooden columns of the size and length commonly used in the construction of cotton and woolen mills. The experiments were made at the instance of the Boston Manufacturer's Mutual Fire Insurance Company, of which Mr. Edward Atkinson is President. This testing machine was recognized as an invention of the greatest importance in the bestowal, through a committee of experts of the gold medal, the highest award of the recent mechanics' fair. Although it has been for some time in operation for scientific and other tests, it gains through this fact a new interest for the public. A part of the columns thus tested were yellow or hard pine and a part oak. About a dozen thus far have been subjected to the process of compression in the machine, the strain having been brought upon them endwise for the purpose of ascertaining what is called the crushing strength of the timber. Outside of these experiments, and a few others previously made at Watertown, none have been made on wooden columns of sufficient size to furnish reliable data for practice. The experiments made elsewhere, and those on which the formulas in the text-books on mechanics and the hand-books are based, have been upon columns of about 2 in. on a side and of 4 or 5 ft. length. From the results thus reached the strength of columns of dimensions actually used in building has been computed. It is plain that a series of experiments conducted under the direction of experts, and by them authoritatively recorded, will constitute much more satisfactory data for the text-books. The experiments, therefore, have a significance beyond the nowise unimportant one that pertains to them in the matter of mill construction. All but two of the columns experimented on were round, hollow columns, of from 8 to 11 in. diameter, the two being about 9 in. square. The greatest amount of pressure exerted in any case was about 265,000 pounds. The tests have disclosed frequent instances of defective boring in the columns. The object in boring is to open an air passage through the heart of the stick for the prevention of dry rot after it is in position in the building. It is essential, of course, that the bore should extend from end to end, but this has not always been effected. The sticks were bored first from one end and then from the other, and the borings have sometimes failed to meet in the middle of the stick. The tests also show that to taper the sticks is a mistake, inasmuch as it weakens the column more than has heretofore been estimated. Reasons for exercising more caution in other respects in the construction and adjustment of wooden columns in building have also been disclosed.—*Boston Advertiser, Nov. 24*

Connecticut Railroads Sued.

A dispatch from Norwich, Conn., says: "During the hottest part of last summer the train officials of the different railroads in the state noticed a short, spare young man, with huge brown mustache, who accompanied their trains from station to station, alighting at each and making critical examination as to their equipments. His movements were mysterious then, but now are clear to them. He was Lewis Rivard, of Norwich, a struggling lawyer, who was admitted to the Bar about two years ago. Under the following Connecticut statute he has brought 115 suits against as many depots in the state as are not provided with water closets.

"'Any railroad company which shall neglect to maintain suitable water closets at each passenger station upon its railroad, for the use of passengers, shall forfeit $100.'

"Mr. Rivard by a following provision receives one-half the penalty, the rest going to the state. Consequently he will, if successful, receive $5,750. Suits have been brought against every company in the state, returnable before Justice Frank H. Brown, of Norwich, early in December. Ex-Governor R. D. Hubbard, of Hartford; Messrs. Watrous, of New Haven; Jere Halsey, of Norwich, and Aug. Brandegee and W. C. Crump, of this city, are mentioned among those who will defend the roads. Rivard's counsel promise to carry the matter to the Supreme Court if necessary. A report that the roads will compromise has no foundation in fact. The case of the Norwich & Worcester road, which came up before Justice Brown to-day at Norwich, was continued to Dec. 17 at request of the road's counsel, Mr. Halsey, who wished more time. As this is the first case much interest is felt in it. This road has eleven stations, which are said not to be provided for as the law directs. It is thought that the companies will try to establish a claim that although they may have a score of stations not legally furnished they are guilty of but one offense."

A Racing Accident.

Travelers through Northwestern Pennsylvania, proceeding west from Corry, either by the Philadelphia & Erie or the New York, Pennsylvania & Ohio roads, have often enjoyed the excitement of a genuine race by rail. The two roads named run close to each other for some miles from Corry, and the western-bound morning trains almost always speed it a bit. One of these races is thus described by the Corry correspondent of the *Oil City Derrick:* "The other morning both trains were speeding along as fast as their engines could turn their wheels. Rounding the curve about one mile and a half above our city, the connecting-rod extending between the drivers of the New York, Pennsylvania & Ohio's machine became loose from its fastening, and with terrific force tore up through the bottom of the cab, shivering to fragments the seat the fireman had occupied but a moment before. That worthy was, to say the least, rather hasty in getting to the rear of the tender, and the engineer, remaining at his post, stopped the train, when the damage was investigated. It was a narrow escape for the knight of the coal-shovel, and there is probably since then one, at least, on that road, who don't believe this racing is all it is said to be."

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EDITORIAL ANNOUNCEMENTS.

Passes.—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

Addresses.—*Business letters should be addressed and drafts made payable to* THE RAILROAD GAZETTE. *Communications for the attention of the Editors should be addressed* EDITOR RAILROAD GAZETTE.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

VENTILATION OF RAILROAD CARS.

Every editor should write at least one article on this subject each year. If he has done this for ten or twelve consecutive years, he will have acquired somewhat of a formula, the elements of which can be transposed in different ways, so that the old facts can be stated in a variety of forms. To be frank with our readers, we will say that the purpose of this disquisition is simply to reiterate the old facts and theories which have been presented in these pages a good many times, as any one may know who will look through the back volumes of the *Railroad Gazette*.

In writing on this subject it would be a very easy matter to look into the encyclopedias and books, and get the true facts about the quantity of air which should be supplied to each person to insure good ventilation. Thus the authorities say that to keep the air in an apartment as pure as it should be to breathe, 50 cubic feet of fresh air should be supplied to each person per minute, and that a good lamp will consume as much air as one man. Therefore a passenger car which seats 64 passengers and has eight lamps should have a supply of $(64 + 8) \times 50 = 3{,}600$ cubic feet of air per minute. That is the amount which should be admitted into the car and as much more exhausted from it each minute. It is very difficult to do this in cold weather and keep a car comfortably warm, as has been shown a great many times when the effort has been made to supply approximately that quantity. Practically, therefore, we are obliged to admit as much fresh air as we can, and be content with what we can get, which is often very little indeed.

It is hardly worth while to recite what travelers must endure at this season of the year, when the windows cannot be kept open with comfort. The vile odors, the oppressive effort of breathing air deprived of much of its oxygen, and contaminated with vile organic refuse exhaled from the insides and the outsides of bodies, which are unwashed externally and unhealthy internally, the dull depression and chill which follow from breathing such an atmosphere, when at the same time the car is rushing through an ocean of pure air—all lead to very vindictive feelings at the ignorance which compels travelers to inhale such foulness. If we look at the conditions, too, which exist under these circumstances, we find that at the front end of the car the air, as though in sympathy with the passengers, was endeavoring to rush into it, and at the back end the bad air inside is trying to get out. To effect good ventilation then all that requires to be done is to permit the air to work its apparent benignant intention. Instead of doing this, what do we find the average car-builder does, and has been doing ever since railroad cars first commenced to smell badly? We find that he has taken great trouble and been at much expense to place a whole row of so-called ventilators on each side of the clear story in the position in which, apparently, the air neither wants to go out nor to come in. Evidently, too, he is often in a more or less confused state of mind about what he intends the air to do. We have seen ventilators of this kind, the intention of which was to admit and exhaust air through the same opening. If the attribute of intelligence is assigned to the atmosphere, it might be said that it had too much sense to do this. In most cases, however, the intention of these ventilators was and is to exhaust the air, while, at the same time, no means are provided by which an equal supply may be admitted. In one case that came under the observation of the writer, the effect of such ventilators was so great that it reversed the draft in the stove-pipe, and drew the smoke downward into the car. Absurd as it may seem, the idea nevertheless seems to be almost universally prevalent that an apartment can be ventilated by permitting the impure air to escape only and without admitting fresh air. This ignorance is colossal in its prevalence, and any apostle of ventilation will in time be certain to regard it with dumb despair, and be hopeless of ever overcoming it; unless some way of injecting intelligence by a kind of hypodermic method into the men who hold this view is devised, it seems impossible to enlighten them. The fundamental principles of ventilation are :

1. *Allow the foul air to escape.*
2. *Admit enough pure air to take its place.*

These two fundamental questions then naturally suggest themselves : Where does the air try to come into a car, and where does it try to go out? To the first it may be said that the only place where the air exerts a pressure to enter is at the front end when the car is in motion. If the front door is opened it comes in like a hurricane. On the sides it may or may not come in, according to the direction of the wind; on the top and bottom there is no decided tendency to come in or go out, and at the back end, as was said before, it tries to get out. Evidently, then, the place to admit air is where it wants to come in, or at the front end. As stated before, if the front door is opened the air rushes in, and it will then flow out through any opening it finds, perhaps more rapidly through the back door or window than anywhere else; but if a window on the side or a ventilator in the clear story is open, the air will escape through it. It is therefore not very important where the opening is for the escape of air, provided there is a liberal admission at the front. The third principle in car ventilation may then be stated to be, that *the supply of fresh air should be admitted at the front end of the car.*

But the reader may say that if you open the front door or window the passengers will be exposed to a cold draught of air, which will be very uncomfortable. This is very true, and to remedy the evil the doors are made with a sliding sash, the amount of opening of which can be adjusted. This is, though, only a partial remedy. In the other cases the end panel in the clear-story is movable and is arranged so that air can be admitted through the aperture which it is intended to cover. The objection to this is that the current of cold air flows into the car in an upward direction and then impinges against the roof and is deflected downward so as to fall like a cold spray over the persons in the middle of the car. If, however, the end window in front of the front stove is raised from six to twelve inches, and the inside blind lowered, it will be found that if the stove is warm a current of air will enter the car through the slats in the blind, and will be deflected upward, around and over the stove, so that the cold air will be mixed with that which has been heated by the stove, and that none of the passengers will feel the current of fresh air that is entering through the open window. It does not matter where the opening to exhaust the air is placed, provided it is not at the front end; the air will flow out of it so long as there is an inward current in front. By this method a car may be very thoroughly ventilated, and ordinarily without any discomfort to any one. The exception is on a dusty road. If this happens, as it sometimes does in cold weather, the dust is liable to enter the end window and be disagreeable. To overcome this trouble on a number of roads an end ventilator or register about 11×16 in. is placed directly over the window nearest the stove. This is so high up that dust is less liable to enter than it is at the bottom of the window, and being directly under the platform roof, the opening is in a great measure protected from cinders. The slats in the register can readily be arranged so that when it is open they will be inclined upward and will direct the cold air over the stove, and thus it will be mixed with the hot air. If there is a corresponding ventilator at the back end, as there must be when the car runs in the opposite direction, and they are both kept open, there will be an inward current at the front end and an outward one at the back, and by this means the air can be kept so pure as not to be offensive. In very cold weather it is best to keep the rear register closed, as much of the hot air from the stove nearest to it will escape if it is open. Sashes or ventilators in the clear-story may be opened instead.

These end registers are now used by Mr. Garey in many of his suburban cars, with very excellent results. We will advertise Mr. Creamer, of New York, gratuitously, to the extent of saying that he made the registers for the New York Central Company. It will also be proper to state, though, that if left to his own devices he will furnish with these registers gratings to cover them on the inside, and will also charge extra for them. These gratings are absolutely useless. They are not ornamental, they obstruct the flow of air, and worse than all, they prevent the passengers from seeing whether the register is open or not. They also cost money. Therefore discard them.

It may be said unhesitatingly that a car will be very much better ventilated with two such registers than it will be with two dozen ventilators in the clear-story. Next, the cost of the latter will be four or five times as much as that of the former. It will be found, though, that for this latter reason the manufacturers of ventilators will discourage car-builders from discarding those in the clear-story; nevertheless it will be found that the latter may safely be done if the sashes there are arranged, as Mr. Pullman makes them, to open on hinges attached to the lower edge. These are very useful if a car becomes too hot, as it often does in winter, as well as in summer. The clear-story sashes may then be opened for the hot air to escape.

Briefly, then, after studying the subject for a long time the conviction arrived at is, that the simplest, most effective and cheapest method of ventilating cars in winter is to put a register about 10 or 11 in. by 15 or 16 in. over each of the end windows next the stove. The latter may be of the simplest form, and if the registers are kept open the air in a car will never become very impure while the train is in motion.

NOTEWORTHY CASES OF PERSONAL INJURY.

We mentioned some months ago a Kansas case holding a company liable for injuries which a boy, while playing about a disused turn-table, sustained through its defective condition. From a recent decision it appears that the right of small boys in Kansas to play about the railroads is not without limits. Near a station was a switch track 280 ft. long, and inclined 4½ ft. in that distance; so that a car switched off upon it needed to be fastened, else it would run down the grade. The cars were usually fastened by means of the brakes. But the boys of the place were addicted to climbing upon the cars, loosening the brakes and taking a free ride down. This was not done by consent of the company; on the contrary, it was forbidden. One day a young boy while taking a ride in this manner, and endeavoring to get off the car before it had quite stopped, fell under the wheels and was killed. The Court held that the company was not liable, for the reason that it had not failed in any duty. Neither the track nor the cars were defective or out of repair. This boy was not a passenger or an employé; he had no right to climb upon the cars; but was a mere trespasser. As toward him the company was not bound to fasten the cars in any particular way; and it had fastened them sufficiently to prevent injury to all persons except one using them wrongfully.

Another small boy case comes from Pennsylvania. He was a newsboy and was accustomed to ride back and forth on the trains to sell papers. He had some oral permission from the conductor for riding as he did; but the rules of the company forbade any person except employés to ride without paying fare or showing a pass; the conductor had not authority to give the leave. At length the boy was killed under circumstances which would have enabled his mother, if he had been a passenger, to recover damages. And she brought suit, claiming that the leave to ride, given to her son, in effect made him a passenger, even though the conductor ought not to have given it. The Court said that when a person gets leave from a conductor to make a trip without paying fare, which leave is granted contrary to the rules of the company, the traveler is legally liable for the fare and the company can recover it from him by an action. Therefore he has the rights of a passenger while on the trip. But this boy rode back and forth not as a passenger, but to sell papers. He was only a trespasser. The company owed him no duty—except to refrain from any wilful injury, etc. Damages could not be claimed for

an ordinary railroad casualty by which he was hurt.

A Kansas woman put two little girls aboard a train of cars intending they should ride to Iowa Point. One of them was less than five years of age; the other older but weak and sickly. They were not placed in any one's charge, nor was any money given them to pay fare. It was the custom of the company to allow mere children traveling with adults to ride free. When the train reached Iowa Point it stopped long enough for passengers to leave. The little girls, however, seem not to have known, until too late, that the stopping place was Iowa Point; at any rate they did not reach the car platform to quit the car until the train was just starting. However, they tried to alight. A passenger tried to help them. The elder one succeeded; but the younger one, when her feet touched the platform of the station, fell forward and she rolled to the ground between that platform and the car. If, now, she had lain perfectly still she would not have been hurt; but she had not presence of mind for this, and her struggles brought her feet upon the track and they were badly crushed. Meantime the conductor had no information that the children were to leave the train at Iowa Point, or that they were traveling by themselves. And when the accident happened it was aggravated by the passengers giving contradictory signals to the engineer. The Court held that the company was not chargeable with any negligence which could render it liable. It was bound to carry the child safely to Iowa Point; but this was done. The company was not bound to know that the child wished to alight at Iowa Point, unless that wish was manifested by giving notice to the conductor beforehand, or going forward to alight when the train stopped. It was the tardiness of the children, and not any fault of the train-men, which delayed their getting off until the train was dangerously in motion. Nor were the employés bound to know that the children were traveling without a guardian; they had a right to suppose that the passenger whom they saw assisting the little girls to alight was a person in whose charge they were. The company was not in fault because a good-natured passenger tried to help the children off, nor because hasty and excited passengers confused the engineer by injudicious signals. The affair was an accident which could not have been anticipated. A railroad company can not be made responsible for an unforeseen accident occurring in the rightful operation of the road: its liability must always be founded on a wrong, a neglect.

A grown woman in Pennsylvania sustained a singular injury in alighting. The train was stationary. The woman was assisted by her husband. On stepping downward from the lowest step of the car she advanced her left foot foremost to the ground, keeping her right foot on the step. While she held that position, and without any apparent cause, her right knee-cap snapped and was fractured. There was no slipping or stumbling, no blow or force of any kind. She brought suit, ascribing the casualty to strain attributable to the step being extravagantly high from the ground. The company denied that the step was unusually high and said that the injury could only be attributed to some constitutional weakness of the lady's knee; and they brought a witness or two to show that the left knee-cap had previously been broken almost as unaccountably. The Court said the jury must decide as well as they could whether the injury was attributable to any negligence on the part of the company; if it was fortuitous—if it could not have been anticipated and provided against—there was no liability. But in a case like this negligence must be affirmatively proved. There was no ground for presuming it. The cars were at a standstill; there was no jar or breaking of machinery; the lady was alighting without any interference from the company; and, if the step appeared too high, she might have demanded better facilities.

A car on the Northern Pacific road left the track; and, as it was bouncing along, one of the passengers endeavored to save himself by rushing to the platform and jumping off. He was badly hurt, but, as the result proved, he would probably have been safe if he had remained in the car. The company urged that the injury was clearly his own fault. But the Court said that the wisdom of jumping in such a case is not to be determined by the result. The passenger must judge of the comparative danger of remaining still or attempting to get off by the circumstances as they appear to him. He has to act upon the probabilities at the time. The jury must judge the case in the same way. If the leap was an act which a person of ordinary prudence might do under the circumstances, it does not prevent the passenger from recovering damages.

Two recent cases have occurred of injury to an employé occasioned by his being knocked from the top of a car by a bridge over the road. Both have been decided, in accordance with previous decisions, that a company is not bound toward employés to place its bridges high enough to admit of a man standing erect on a car underneath. Injury from a low bridge is one of the risks of a brakeman's employment.

An Illinois decision discusses the effect of a conductor's urging a person to a dangerous act. A long freight train ran into the city of Knoxville and was left standing on the track in such position that the middle part of the train stood opposite a street, and thus the cars obstructed any one in crossing. This street was the natural passage for persons coming to take passenger trains. The trainmen ought to have divided the freight train; but they had not done so. Mr. Sykes, approaching with intention of boarding an expected train, found himself hindered by the freight cars, and stopped on the sidewalk, hesitating how to cross. The conductor called to him, "Come on under; you will have plenty of time." Thus encouraged, Mr. Sykes tried to creep under the freight cars, but at that moment the engineer started them, and Mr. Sykes was fatally injured. The Court said that a conductor has not unlimited authority to invite persons to take risks, and a traveler or passenger is not justified in doing what is evidently foolhardy because a conductor tells him to. But, under circumstances like these, the jury might well consider the company as doubly liable: 1, for fault in not dividing the train; 2, for the conductor's invitation. The negligence, if any, attributable to Sykes, was too slight to defeat an action for damages.

The question has often been discussed what agents have authority to bind the company by calling a physician or surgeon to treat a person suddenly injured by a railroad accident. A laborer on the Atchison & Nebraska Railroad had his foot nearly cut off by some accident with the machinery in use, and the "boss" of the gang in which he was working telegraphed to the General Superintendent to know if he might "get a doctor for him." The Superintendent telegraphed in answer: "Yes; and do all you can to save the foot and make him comfortable." The Court held that by this telegram from the General Superintendent the "boss" was authorized to employ a physician or surgeon, and also to engage reasonable board while the foot was being treated. Board and care while one is suffering from a wound are within the direction "to make him comfortable." And it was not necessary to wait for a formal letter signed by the Superintendent; a telegram was sufficient. When an employé goes to a telegraph office and sends a dispatch to his superior, and in a short time receives from the same operator what purports to be an answer from the superior to his dispatch, he is warranted in presuming that the dispatch received is genuine, and in acting according to it.

Falsification of Freight Classification.

A misrepresentation of the class of freight is very likely to occur when not easily detected, because the charges for one class are often very much higher than for others. It is true that the lowest classes are usually freights whose nature cannot easily be concealed, as grain in bulk, provisions, lumber, coal, etc.; but there are differences enough in the rates on merchandise proper—goods in boxes, bales and barrels—to make it an object to pass off first-class for second or third-class freight. Indeed, last year a prominent lumber dealer in Chicago was convicted of shipping large quantities of lumber over a railroad billed as salt, on which the rate was much lower. This enabled him to undersell other lumber dealers, and when his trick was detected he was expelled from the Chicago Lumber Exchange. (The lumber was neither loaded nor unloaded by the railroad company or on its premises.) This shows that the public as well as the railroads have an interest in having freight shipped under its true classification, the interest that there should be no discrimination between shippers, and that the dishonest merchant should not have an advantage over the honest one in the rates for which his goods are carried.

We have not heard many complaints of frauds in classifications; but perhaps there are more than are known. The commonest irregularity in connection with classifications is in accepting freight as of a class lower than that to which it actually belongs, which is one of the many ways in which railroads pretend to maintain rates while actually diverting their rival's customers by giving them advantages. But considering human nature and the great differences in the rates by different classes, we should naturally expect many attempts to bill falsely. This is obtaining goods on false pretences, and should be punished as such; but in most cases probably the deceived carrier, when it detects a case, does not even collect the balance of freight due it, which is as much a debt as any other.

In Chicago, last Saturday, a meeting of general freight agents was held at the office of the Western Weighing Association, to provide means, by co-operation, to prevent frauds in classification. It was said that starch was frequently shipped as flour, cutlery as hardware, etc.; and the car load of dynamite which exploded at Council Bluffs recently, doing immense damage, was shipped as "blasting powder." At this meeting, at which only Chicago roads were represented, we believe, it was agreed to establish a bureau of inspection, with authority to examine all receipts, and, if necessary, all packages at the different freight depots, and put it in charge of Mr. J. R. Wheeler, the Superintendent of the Weighing Association, which has in another way been of very great value to the roads concerned, and supplies an organization ready made to undertake this or any similar work.

If an inspection should be made of every package shipped, it would be an enormous labor, and extremely difficult to accomplish; but there will be comparatively few shipments about which there will be any question, and it will not be necessary to examine all the suspicious shipments, even, at one time. The shipments of one shipper after another may be inspected, and it will not be long before the knowledge of the existence of such an inspection will almost put an end to attempts at such frauds, and then probably only a very small inspecting force will be required.

It may be said that each railroad should make its own inspection, and certainly the original receiver of the freight should be in position to learn what the goods are which he receives. But in the actual condition of things the railroads have to protect themselves not only against shippers but also against each other. One road may wink at shipments of starch as flour in order to divert the starch shipments from a rival road, and the roads from Chicago west receive vast quantities of freight from their eastern connections which, ignorantly or otherwise, may have billed them wrongly; a joint agency for doing this work, therefore, may effect what independent action could not.

This is a movement which is likely to be strongly supported by all honorable merchants, who feel very bitterly when their business is taken from them by the fraud of their competitors, and are likely to charge the railroad companies with knowingly discriminating against them in such cases. Certainly the railroads, like the rest of us, owe it to the community and to the cause of public morals to secure at least an equal chance to honest dealers, and not leave them to labor under special disabilities in competing with their unscrupulous competitors.

Foreign Railroad Notes.

A special commission was appointed in Belgium some time ago to inquire into the best means of promoting the construction of local railroads. One of the questions proposed to the commission was: "How can we avoid the dangers of the competition which these secondary lines, combined together, might make with the principal lines." The commission answers that, in the first place, the state should endeavor to *prevent* competition with the principal lines, by chartering only such local roads as could not compete; in the second place, that if, notwithstanding, the local roads should succeed in competing, the state should always have the weapons to combat it successfully, and that those weapons should be furnished by the law; third, that one of the methods to be left in the hands of the state should be the right of *preventing reductions* in the rate, or to require advances in them; fourth, that such competition will occur, in fact, only where one local road (chartered as such or formed of several sections chartered separately) should connect two places already secured by stations of the principal lines.

This proposal to arm the government with extraordinary powers *to prevent* competition, which everywhere in the commission's report is assumed to be an unmixed evil, is in striking contrast with the action of most American public bodies.

The International Statistical Congress in 1878 agreed upon a form for reporting railroad statistics for all European countries. A volume of statistics prepared in accordance with this form has been published, covering the year 1876, and intended as a sort of trial volume. Novel features in it are separate statements of the length of line of steel and iron rails and of different grades and curves. This trial volume does not include Great Britain, Russia nor Spain, nor under some heads the state roads of Belgium—whose statistics for that year doubtless did not cover all the points. It appears that the levelest roads in Europe are in Holland, where nearly 62 per cent. of the lines are absolutely level, and only 27 miles (out of 945) have grades between 26 and 79 ft. per mile. In Germany nearly 25 per cent. of the mileage has such grades, but nearly three-fourths has no curvature. A little more than half the length of the Norwegian roads is is curves, and three-eighths has grades between ½ and 1½ per cent.

There are so many gaps under the different items, and so

many important countries are absent altogether, that no totals or averages for Europe can be taken from these statistics, which serve rather as a model of what it is intended to do than as satisfactory international statistics. The form for the tables has 272 different columns, but in many cases the figures in one column are derived from other columns, and are filled by the statistical office if not reported. Thus among the column heads are "average passenger journey," "average number of passengers per *axle*" (better than car where the vehicles have a varying number of axles and consequently are of different sizes), "average freight load per axle," "proportion of average load to capacity," "receipts per car-axle kilometre," etc. For the above the only data required not usually given in our reports are the mileage and average capacity of freight and passenger cars.

The *Journal* of the German Railroad Union publishes a translation of the constitution and by-laws of the American Association of Railroad Superintendents.

The Russian government has guaranteed the shares of most of Russian railroads. It owns itself $585,000,000 out of a total of $965,000,000 of shares, has guaranteed $360,000,000, and there is but $90,000,000 in the hands of private persons unguaranteed. It is called upon to pay a very large part of what it has guaranteed, and these payments increase from year to year. In 1874 they were $8,500,000, in 1877 $18,000,000, and in 1879 $23,500,000. For 1880 the accounts are not yet completed, but the amount will be much larger than before, because several roads, previously prosperous, failed to earn dividends that year, and it is thought that the government will have about $30,000,000 to pay.

The statistics of the Prussian railroads for the year 1879 show that their working expenses were 54.3 per cent. of their receipts, amounting to $6,092 per mile of road, to 97 cents per train-mile, and to about 2¼ cents per *car-axle* mile—cars having from two to three axles. Of these expenses 33.5 per cent. was for what are called road expenses, 55.4 for transportation expenses (including rolling stock), and 11.1 for general expenses. The profits were at the rate of 4.9 per cent. on the capital invested. The average dividend on all the common stock outstanding was 4.91 per cent. In 1871 it was as much as 8.43 per cent., falling in 1873 to 5.94, in 1875 to 5.30, and in 1877 to 4.62 per cent. A very small part of these dividends came from government guarantees, but those paid from the profits of the roads were 8.21 per cent. in 1871 and 4.67 in 1879.

Statistics of the Prussian roads for 35 years show a constantly decreasing proportion of passenger earnings. These were 65 per cent. of the whole in 1844, as early as 1849 had fallen to 49.1 per cent., in 1879 to 33.3 per cent., in 1869 to 27.6 per cent., and in 1859 to 24.5 per cent. In this the Prussian are like the American roads. The average earnings per mile increased every five-year interval until 1874, when they reached their maximum, $14,175, falling to $11,170 in 1879. From 1869 to 1874 earnings increased $2,440 per mile, but the expenses in the same period increased not less than $3,800 per mile. In 1879 the expenses per mile were nearly the same as in 1869, $6,092.

A few years ago a great outcry was made in Germany because rates per mile on grain and lumber from Austria and other countries south and southeast of Germany were lower than on shipments made from German stations. The shipments were largely for export, and finally exceptional export rates were made for grain arriving at German ports on the North Sea. Latterly a combination of Russian and North German roads has been made which has made rates on grain from Roumania and Southwestern Russia so much lower than the old export rates that Hamburg, Bremen, etc., complain that they cannot get any of the business. But usually the chief competition for grain going to North Sea ports—including England and the north of France—is by vessels that pass through the Bosphorus and the Mediterranean. The export rate to the latter countries from Jassy is reported to be 76 cents per 100 lbs. *via* Hamburg, and 53 cents *via* Galatz and the Mediterranean. It is with this grain that American grain has to compete; and these rates would seem to go far to explain our ability to meet the competition. The shipment *via* Galatz includes but a very short railroad journey, and the sail is about the same in length as that from our Atlantic ports. The rate, however, is about four times the current steamer rate from New York to Liverpool. And the rate *via* Hamburg, which includes a haul by rail several hundred miles long, is about twice the current rate from Chicago to Liverpool, with nearly a thousand miles of railroad transportation. There was a conference of the railroads, the grain merchants and the farmers at Breslau recently, to consider this subject. The merchants wanted the rates reduced, the railroads (state railroads) agreed that rates must be reduced or the traffic all lost, but the farmers voted no, decidedly, and the inland town of Breslau wanted to make it a condition that the grain arriving from foreign countries should be transferred in that place!

For the nine months ending with September last the British Board of Trade reports that there were 117 railroad collisions and 251 other train accidents. By these train accidents 9 passengers and 7 employés were killed, and 649 passengers and 99 employés injured. By all railroad accidents 796 persons were killed and 6,094 injured. As elsewhere, the persons killed on the road are many times in number those killed on the trains.

A record of accidents is kept in England with such completeness that they have served as the subject of a paper read before the Statistical Society. The violent deaths amounted to 1 to 1,250 of population, and the proportion tends to increase—one death out of 31 was by violence in 1870; one out of 28 in 1878. The most dangerous employments were as follows: first, the merchant marine, in which 150 sailors are lost to every 10,000; the navy, with 40 deaths by violence to every 10,000; the railroads, with from 25 to 35 to 10,000, according to locality; and mining, in which the rate a few years ago, 36 to 10,000, has fallen to 23 to 10,000.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

Bangor & Katahdin.—Completed from Milo, Me., northwest to the Katahdin Iron Works, 19½ miles.

Chester & Lenoir.—Extended from Lincolnton, N. C., northward 5 miles. Gauge, 3 ft.

Chicago Texas & Mexican.—The first track is laid from Dallas, Tex., southwest to Cedar Hill, 18 miles.

Cincinnati, Green River & Nashville.—Completed from King's Mountain, Ky., westward to Grove City, 12 miles.

Denver & Rio Grande.—The *Eagle River Branch* is extended from Eagle Park, Col., to Red Cliff, 5 miles. The *Crested Butte Branch* is completed from Gunnison, Col., to Crested Butte, 28 miles. Gauge, 3 ft.

Dover & Rockaway.—Completed from Port Oram, N. J., eastward to Rockaway, 5 miles.

East Tennessee & Western North Carolina.—Extended from Elizabethton, Tenn., eastward to Hampton, 8 miles.

Flint & Pere Marquette.—The *Manistee Branch* is extended from the Sable River northwest to Stronach, Mich., 8 miles.

Gulf, Colorado & Santa Fe.—The *Ft. Worth Branch* is extended from Cleburne, Tex., northward to Ft. Worth, 30 miles.

Indiana, Bloomington & Western.—The new *Eastern Extension* is extended eastward to Newcastle, Ind., 20 miles.

Indianapolis & Evansville.—The first track is laid from Washington, Ind., south by west to Petersburg, 11 miles.

Milwaukee, Lake Shore & Western—The Northern Extension is extended from Kempster, Wis., north to Summit Lake, 6 miles.

New Brunswick.—The Aroostook Branch is extended from Caribou, Me., southward to Presque Isle, 10 miles.

Northern Pacific.—Extended from the O'Fallon River west to Ft. Keogh, Montana, 51 miles.

Pennsylvania.—This company's *Philadelphia & Long Branch* line is 27½ miles long from Whitings, N. J., to Bay Head, being 2½ miles more than we have heretofore stated.

Port Huron & Northwestern.—The *Marlette Branch* is extended from Marlette, Mich., west by north to Vassar, 26 miles. Gauge, 3 ft.

St Louis, Hannibal & Keokuk.—Extended from Eolia, Mo., southward to Silex, 10 miles.

St. Louis, Iron Mountain & Southern.—The *Louisiana Branch* is extended from Chidester, Ark., southeast to Camden, 16 miles.

St. Louis & San Francisco.—The *Arkansas Division* is extended from Fayetteville, Ark., southward to Brentwood, 18 miles.

St. Paul, Minneapolis & Manitoba.—The *West Side* line is now completed from Fargo, Dak., north to Minto, 31 miles.

Texas & Pacific.—Extended from Cariso Pass, Tex., westward to Sierra Blanco, 27 miles.

Walton.—Extended frem Pleasant Valley, Ga., to Walton, 3 miles. Gauge 5 ft.

This is a total of 370 miles of new railroad, making 7,353 miles this year, against 5,624 miles reported at the corresponding time in 1880, 3,445 miles in 1879, 2,207 miles in 1878, 1,877 miles in 1877, 2,177 miles in 1876, 1,237 miles in 1875, 1,767 miles in 1874, 3,507 miles in 1873 and 6,885 miles in 1872.

THE QUESTION OF FREE PASSES has again been brought up at Chicago, where, on the invitation of Mr. Ackerman, President of the Illinois Central, a meeting of presidents and general managers was held last week to see what could be done to lessen the evil. The meeting was well attended, and there is said to have been but one opinion as to the desirability of restricting the issue of passes within the narrowest limits possible, but a good deal of distrust as to the possibility of effecting much.

It is true that it requires something like unanimity of action to carry out this reform completely, but it would seem perfectly practicable to do away with the worst features of the practice by the combined action of a considerable number of roads. Passes are granted for all sorts of reasons and for no reasons at all. Some are substantially payment for services rendered, and these are objectionable chiefly because they are not formally treated as a commodity of so much value exchanged for definite services; others are given to induce shipments, and are equivalent to a rebate, and are objectionable for the same reason—because they make possible underhand competition, and because they are not given to all alike under the same circumstances; others, and a large number, are given to secure the "good will" of persons influential in different ways—city officers, members of legislatures, journalists, etc. The time is probably long past when the railroads expected to get any positive service in return for passes given to these classes; but they now suffer the penalty for their original sin in beginning the practice; they dare not give it up less they should incur the positive and active ill-will of people who have come to look upon passes as a debt which the railroads owe them. The most active anti-railroad legislator is likely to have special attention even from the railroad companies, because they feel that neglect to provide him with passes, when they have so long granted them to legislators, would be looked upon as an effort on their part to punish him for his hostile attitude.

The way out we believe to be to abolish passes, except for employés, and in cases where they are exchanged for services openly and above board, just as other goods might be. The issues of passes to public officers are simply scandalous; though, so far as legislatures are concerned, being given to friend and foe alike, and known to be so given, they have absolutely no effect, except to convince the legislators that the railroads are very timid, and good subjects for the "striking" politician to bleed.

CHICAGO AND MILWAUKEE RECEIPTS OF GRAIN AND FLOUR were much smaller in November this year than before for several years. Taking both places together, and reducing flour to bushels, the receipts in November for four successive years have been:

	1878.	1879.	1880.	1881.
Bushels.	14,981,811	14,386,998	17,123,542	11,127,657

Thus the receipts this year are 35 per cent. less than last year and 22½ per cent. less than in 1879. For the last five months these receipts have been:

	1878.	1879.	1880.	1881.
July	13,545,507	12,876,734	17,935,109	10,880,894
August	21,416,055	16,594,375	20,243,473	23,673,523
September	18,344,466	20,866,921	21,793,629	21,906,104
October	17,438,455	24,707,366	24,738,125	18,088,185
November	14,981,811	14,386,998	17,123,542	11,127,657

July and August may be considered as the last months of the crop-year 1880 for these places. In them, we see, the receipts were larger this year than ever before.

September was the first month of considerable receipts from the new crop of small grain, and in it the receipts were nearly the same as last year (a trifle larger). They were increased by a "corner" which caused extraordinary prices, and the receipts were chiefly corn, and not due to this year's crop.

In October the receipts were one-fourth less and in November 35 per cent. less than last year.

It will be interesting to consider the changes from month to month in the different years. August was the month of largest receipts this year, and there was a decrease of 1,764,000 bushels in September, of 3,821,000 more in October, and of 6,960,000 more in November, when the receipts were not half as great as in August. But last year October was the month of maximum receipts, and the November receipts were but 3,120,000 bushels less than in August, instead of 12,546,000 less, as this year. So also the maximum receipts were in October in 1879, and the course of receipts was much the same as in 1880. In 1878 the course was more as in this year, with maximum receipts in August, and declining every month thereafter; but the decline from August to November then was but 6,434,000 bushels, instead of 12,546,000. A large decline from October to November has been common in all years, however. It amounted to 2,457,000 bushels in 1878, to 10,320,000 in 1879, to 7,615,000 in 1880, and to 6,961,000 this year. The difference is that the decrease this year is from a much smaller amount than the October receipts in 1879 and 1880.

THE ATLANTIC GRAIN EXPORTS have fallen off at an alarming rate since September. For the eight weeks ending with Nov. 30 the exports of all grain, flour included, were 20,085,000 bushels this year, against 43,041,000 in the corresponding weeks of 1880. This is a decrease of no less than 22,956,000 bushels, or 53⅓ per cent., and of course it makes a very great difference in the commerce and traffic of the country. At the rates of last year the freights on this grain before reaching the Atlantic ports probably amounted to $8,600,000; this year to not more than $3,000,000. The loss of course has not fallen exclusively on the railroads, but very largely on the lake vessels and canal boats. The roads between lake ports and the seaboard have carried about as much as last year (at about half the rates), while the Western roads, which carry to the Northwestern markets, have carried much less, but generally at full rates.

This great decrease in exports has been in spite of very high prices for grain, and freight rates, both by rail and water, much lower than ever before in these months. It would seem that these should have induced exports as large as the country could spare; but much depends upon the faith of farmers and grain merchants in the future of prices. Though prices be high, compared with previous years, yet if they believe that they will be higher hereafter they will hold their grain. But in view of the crop reports of the Agricultural Department, indicating a decrease of 100,000,000 bushels of wheat and 442,000,000 of corn from the crops of 1880, it would seem that we need not look further to account for the decrease.

The decrease for October and November is in everything except oats; but the only items of importance are flour, wheat and corn. And of the whole decrease of 22,956,000 bushels, no less than 15,096,000 was in wheat and flour, the exports of which fell off 40 per cent. (from 25,129,000 to 10,026,000 bushels); but there was also a decrease of 7,216,000 bushels (46½ per cent.) in corn.

It should be remembered that the above figures do not include the exports from the Pacific coast, which are much larger this year than ever before, and are almost exclusively wheat. These, however, have little effect on traffic and commerce this side of the Rocky Mountains.

CHICAGO RAIL SHIPMENTS EASTWARD were 46,574 tons during the week ending Nov. 26, when they (or rather those billed from Chicago) were reported to be about 11,000 tons less by the Board of Trade. The shipments were 2,847 tons

less than the week before and the smallest since the low rates were made. For the corresponding week last year the shipments were 48,636 tons, or 2,062 tons more than this year. For three successive weeks the Chicago shipments have been less than last year, yet only a little less. For the whole month of November, however, the shipments must have been nearly the same as last year; which is not very satisfactory when we remember that for the four months previous the shipments were 1,043,949 tons this year, against 660,431 last year—an increase of 58 per cent. If the change were due to the higher rates, it would be acceptable enough; but the rates now are about as much less than last year as they were in the summer and early fall.

Of the shipments of the week ending Nov. 26, 7.5 per cent. went by the Grand Trunk, 26.3 by the Michigan Central, 25.6 by the Lake Shore, 22.1 by the Fort Wayne, 14.8 by the Panhandle, and 3.3 by the Baltimore & Ohio.

For the week ending Dec. 3, the shipments billed at Chicago, reported by the Chicago Board of Trade, were 46,958 tons, of which 6,080 were flour, 26,410 grain and 14,468 provisions. As the total shipments usually include several thousand tons more than are reported by the Board of Trade, this indicates a decided revival in shipments.

THE APPLICATION OF LICENSE LAWS TO DINING CARS is a question which has recently come up in Illinois, and threatens to be an embarrassing one. On these cars wine and beer are sold to the passengers, and as one of them in the course of its run may pass through fifty or more municipalities, the question is whether the law of each must be applied within its limits. On the Wabash road the village of Taylorville, Ill., prohibits the selling of liquor within its limits. Nov. 15 last the village Marshal, acting under instructions from the town authorities, entered the dining car while the train was standing at the depot and bought a bottle of beer from the car conductor, who took him for a passenger. The Marshal then arrested the conductor, who was then tried and fined for violating the village ordinance, and then re-arrested for violating a state law and held to await the action of a grand jury.

Now, the question is not limited to the case of towns which have prohibitory laws, by any means, but if the law of the locality must be strictly obeyed, the car must take out a licensee for every municipality which it crosses, or at least for every one within which it sells these beverages, and a sharp outlook must be kept for the boundaries of "no-license" towns, etc. To take out a license for every town crossed would cost enormously (some towns charge $500) and it certainly is very inconvenient, to say the least, to have to change laws, in a matter of daily practical application, every quarter of an hour.

The Wabash Company claims that the arrest and prosecution in the Taylorville case were illegal, and it is understood to support its conductor in a suit he has brought against the town authorities for damages, and which, it is hoped, will be a test case.

THE CHICAGO LUMBER TRAFFIC shows a great gain over the very large business of last year. For the 11 months ending with November increases of 19½ per cent. in receipts of lumber and 22 per cent. in receipts of shingles are reported, and increases of 21½ per cent. in shipments of lumber and of 17¾ per cent. in shipments of shingles. That this traffic should continue so heavy in the fall, after the condition of the crops was fully known, is significant. Lumber would not have been bought so largely in the West unless there was a continuance in prosecuting new enterprises—opening farms and putting up buildings, etc.,—and faith in the disposition and ability of the people to make improvements and pay for them. The increase in shipments since July has been greater than before. For the first seven months of the year it was 17½ per cent., while for the 11 months it has been 21¼ per cent. The demand for this lumber is not from farmers chiefly, but it is almost wholly from people and industries supported by farmers, and the great activity in this business is the best evidence we have seen of the ability of the farming interest of the upper Mississippi valley to endure their losses from poor crops. If they were the only consumers, doubtless the demand for lumber would be lighter than it is; but most of the lumber doubtless goes into structures in the towns and villages, which are built by people who count on business from the farmers not so much this year as in following years, and this they see to be growing in spite of one bad season.

THE NUMBER OF TRAINS EACH WAY DAILY on the New York elevated railroads at the present time is as follows:

Second avenue road	236
Third avenue road	427
Sixth avenue road	335
Ninth avenue road	173
Total	1,171

At one time there were 440 trains each way daily on the Sixth avenue line, and after the introduction of four-car trains 401 trains were run for a long time on this line. The reduction is made in the number of trains in the middle of the day and late, there being as many as ever in the busy hours. In the busiest hour no less than 44 trains run south over one track, and 42 trains are dispatched from a single station in one hour—which, we venture to say, is unexampled in the history of railroads.

THE COTTON CROP OF 1881 is estimated by the Department of Agriculture to be 2,346,389,000 lbs. The crop of 1880, by the *Commercial and Financial Chronicle's* report, was 3,201,546,730 lbs., and the decrease is 26¾ per cent. The crop of 1879, as reported by the census, was 2,367,860,000 lbs., from 12,595,000 acres, while the slightly smaller crop of 1881 is from 15,539,000 acres, the average yield per acre falling in these years from 188 to 151 lbs. The decrease in this crop is larger in proportion than that of wheat (20 per cent.) and a little larger than that in corn (25.7 per cent.); but transportation is much more likely to be affected by the decrease in the grain crops, because in any event a large portion of the wheat and most of the corn is consumed where it is raised, while nearly all the cotton is shipped. The percentage of decrease in the surplus grain marketed must be much greater than that in the whole crop. Altogether there is so general a decrease in the chief crops of the country that we may expect the carriers nearly everywhere to be affected.

THE GRAIN TRAFFIC OF MONTREAL shows a larger percentage of decrease this year than that of any other place except Philadelphia. Its season is short, as nearly all its receipts are by the St. Lawrence River, and when the river is closed the Grand Trunk delivers grain at Portland and Boston instead of Montreal. Including flour its receipts of grains of all kinds were 17,519,307 bushels this year, against 25,764,447 last, a decrease of 8,245,140 bushels, or 32 per cent. Probably the low rail rates have had something to do with its decrease, there being less than the usual advantage in the water rate.

NEW PUBLICATIONS.

Journal of the Association of Engineering Societies.—The sub-title of this new journal is, "Transactions of the Boston Society of Civil Engineers, the Engineer's Club of St. Louis, the Western Society of Engineers, and the Civil Engineer's Club of Cleveland, published by the Board of Managers of the Association of Engineering Societies. H. G. Prout, Secretary of Board; No. 12 Barclay street, New York."

The title of this journal indicates its general character. For the last year and a half the project of issuing a joint publication has been under discussion by the members of the four societies whose names are given on the title page. After a good deal of negotiation the project was arranged and the number before us is the first one issued under the new arrangement.

The affairs of the Association in charge of the publication are conducted by a board of managers consisting of one representative for each hundred members of the different societies composing the Association. The papers of each are prepared by its Secretary for publication, and are forwarded to a secretary of the Board of Managers, who has direct charge of the printing of the *Journal*. The latter and other publications will be open for subscription and sale, and it is intended to print with it abstracts and translations from scientific and professional journals. Any society of engineers may become a member of the Association by conforming to the rules and regulations provided for that purpose.

That the co-operation of these different societies in this way and for the purpose named may have a very important influence on the organization of the engineering societies in the future is very probable. Any one who has been observant of the subject must have long since come to the conclusion that one society cannot occupy the whole of this country, as the Institutions of Civil Engineers and of Mechanical Engineers do in Great Britain. The great extent of our country makes anything like general meetings which are more frequent than annual or semi-annual occasions impossible. A national society must, therefore, here assume a peripatetic character; that is, must hold its meetings once or twice a year in different parts of the country. But, quite naturally, the engineers in different sections are inclined to meet together oftener than this, and therefore separate local organizations have been formed in different cities. As the number of engineers increases this process will continue, and thus it seems inevitable that the organization of a really national society must assume a federal character, such as that which has undertaken the publication of this *Journal*.

The first number is well printed and well arranged. A considerable space is devoted to the history, first of the joint association organized for the purpose of publishing the *Journal*, and second of each of the separate societies. The Boston Society of Civil Engineers contributes a paper on the "Percolation of Water through Sand," by A. Fteley, with a brief report of the proceedings of meetings held Sept. 21 and Oct. 19.

The Engineers Club of St. Louis gives some historical notes and a translation of a "Report of M. Keller upon a Memoir presented by M. O. Hallauer upon 'Steam Engines;'" a paper by William Cordes on "Explosions of Flour Dust," and a brief report of proceedings of a meeting held April 13.

The Western Society of Engineers also gives a brief account of the origin of its existence; a paper on the Hudson River Tunnel, with illustrations, by Wm. Sooy Smith & Son, and reports of meetings of Sept. 13 and Oct. 18.

The Civil Engineers' Club of Cleveland gives its genealogy in the form of a report of early meetings, the address of its President, Mr. Charles Paine, at the inaugural meeting, a paper on Street Pavements by E. O. Schwägerl, and notes of proceedings of a meeting held Sept. 14.

The doubt which will suggest itself about the success of this enterprise is whether these societies will be able to produce enough papers of a sufficiently high standard to make the publication successful. If they can, the project is likely to have an important influence on the organization of engineering societies in this country. That there is a great deal of dissatisfaction among the "non-resident members" of the American Society of Civil Engineers with the manner that it is conducted there can be no doubt, and it only lacks organization and some defined plan for remedying the evils complained of to make itself felt in that body. Should the joint action of the societies which form the association described prove successful, it may ultimately lead to a general federal organization, including all the local societies in the country.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:

Boston & Maine, annual meeting, in the City Hall, in Lawrence, Mass., Dec. 14, at 10:30 a. m.

Cleveland & Pittsburgh, annual meeting, at the office in Cleveland, O., Jan. 4.

Railroad Conventions.

A meeting to consider the *Ticket Commission* question will be held at the Grand Pacific Hotel, in Chicago, Dec. 15, at 11 a. m. All railroad companies are requested to send representatives.

Dividends.

Dividends have been declared as follows:

Central, of Georgia, 4 per cent., semi-annual, payable Dec. 15.

Connecticut River, 4 per cent., semi-annual, payable Jan. 2.

Fitchburg, 3 per cent., semi-annual, payable Jan. 2. The July dividend was 3½ per cent.

Chicago & Northwestern, 1¾ per cent., quarterly, on the preferred stock, payable Dec. 28. Transfer books close Dec 10. Also 3 per cent., semi-annual, on the common stock, payable Dec. 28.

Morris & Essex (eased to Delaware, Lackawanna & Western), 3½ per cent., semi-annual, payable Jan. 3. Transfer books close Dec. 10.

New York, New Haven & Hartford, 5 per cent., semi-annual, payable Jan 2.

Southern Railway & Steamship Association.

The following circular has been issued from the office of the General Commissioner:

"In accordance with the action of the eighteenth session of the Rate Committee, a meeting of the Rate Committee is hereby called at No. 46 Broad street, New York, on Wednesday (at noon), Dec. 14, 1881, at which time the first business to be considered will be the adoption of a uniform form of bill of lading for all lines on north and west-bound business.

"The Bill of Lading Committee of the Coastwise Steamship Association will meet with the Rate Committee for conference on this subject.

"Other matters will as usual be considered. * * * In accordance with the rules, all members of the Association, or lines working with it, are invited to send representatives of their lines, if desired, to this and all sessions of the Rate Committee.

Railroad Stenographers' Association of Chicago.

The Railroad Stenographers' Association of Chicago held their first regular meeting at the general freight office of the Illinois Central Thursday evening, Dec. 1.

This association is composed of stenographers connected with the several roads centering in Chicago exclusively.

The object of the organization is to bring together in good fellowship all railroad stenographers in the city.

The following officers have been elected by the association: F. B. Bowes, President; J. S. Macabe, Vice-President; S. Van Horn, Secretary; E. L. Booth, Treasurer.

Railroad Conductors' Life Insurance Association.

The annual convention of this Association met in Masonic Hall, New Orleans, Dec. 7. A large number of delegates was present from all parts of the United States and Canada. President Brigham called the convention to order, and Mayor Shakespeare delivered an address of welcome. Ex-President Titus delivered the annual address. President Brigham read his annual report, showing that there have been 27 assessments during the past year—18 for deaths, 8 for disability, and 1 for expenses—and that nearly $37,000 have been paid out. After the appointment of committees, the convention accepted an invitation to visit West End. Excursions have also been tendered to Mobile by the Louisville & Nashville Railroad, and to the sugar district by the Morgan line.

ELECTIONS AND APPOINTMENTS.

Arizona & Nevada—The directors of this new company are: Paul Brion, John J. Gosper, Frank Staples, of Arizona; John Lloyd, P. Peckham, John N. Risdon, Robert N. Risdon, J. W. Smith, San Francisco; W. H. Steymus, New York.

Boston & Winthrop.—This new company was organized in Boston, Dec. 3, by the election of the following directors: Samuel W. Hale, Keene, N. H.; John H. Buttrick, Lowell, Mass.; John Lowell, Jr., Newton, Mass.; Clarence A. Parks, Wakefield, Mass.; Samuel Ingalls, Winthrop, Mass. The board elected Samuel Ingalls President; John H. Buttrick, Vice-President; C. N. Goodrich, Clerk; Nelson K. Baker, Treasurer.

Buffalo, New York & Philadelphia.—At the annual meeting Dec. 3 the following directors were chosen: Franklin D. Locke, Bronson C. Rumsey, Lawrence D. Rumsey, Jacob F. Schoellkopf, Buffalo; Clarence H. Clark, J.W. Jones, Philadelphia; Bryce Ford, Wm. B. Isham, Archer N. Martin, John Paton, Theodore Seligman, Isaac N. Seligman, Edward F. Winslow, New York. The board elected Bronson C. Rumsey President; J. W. Jones, Vice-President.

Canadian Pacific.—The offices of the Eastern Division will be removed from Brockville, Ont., to Ottawa on Dec. 10. The Locomotive and Store departments will remain at Brockville until further notice.

Chicago, Burlington & Quincy.—Mr. Allen Potter is appointed Train-Master of the Middle Iowa Division, and Mr. F. L. Corwin Train-Master of the Western Iowa Division. Both have been conductors for some time.

Chicago & Eastern Illinois.—The board has elected Franklin H. Story, of Boston, President in place of F. W. Huidekoper, resigned. Mr. Story has been Vice-President for some time. It is understood that Mr. Story will not take the active management of the road as Gen. Huidekoper did, and that a general manager will be appointed.

Cincinnati, Green River & Nashville.—The officers are: President, E. Zimmerman; Secretary and Treasurer, G. Bradshear; Superintendent, George B. Harper; General Freight and Ticket Agent, A. O. Watkins. Office at King's Mountain, Kentucky.

Cleveland, Akron & Columbus.—This company was orga-

nized as successor to the Cleveland, Mt. Vernon & Delaware Dec. 1, by the election of the following directors: Jarvis W. Adams, L. A. Russell, Cleveland, O.; G. A. Jones, W. H Upson, Akron, O.; C. J. Canda, J. A. Horsey, W. A. Schaap, New York. The board elected C. J. Canda, President; W. A. Schaap, Secretary.

Denver & Rio Grande.—Mr. George Revett has been appointed Superintendent of the Lumber and Tie Department, with office at Colorado Springs.

Mr. E. R. Murphy is appointed Auditor is place of Loring S. Richardson, resigned.

Mexican National.—Major W. J. Brokaw has been appointed Master Mechanic of the Colima Division, with headquarters at Manzanillo, Mexico. The appointment dates from July 15. Major Brokaw was formerly General Traveling Engineer of the Texas & Pacific, and at one time had charge of that company's shops at Marshall.

Michigan Central.—Mr. O. W. Ruggles is appointed General Passenger and Ticket Agent, in place of Mr. Henry C. Wentworth, resigned. Mr. Ruggles is now Assistant General Passenger Agent of the Missouri Pacific, and was formerly General Passenger Agent of the St. Louis, Iron Mountain & Southern.

Milwaukee, Lake Shore & Western.—The reported resignation of General Superintendent H. G. H. Reed has not been confirmed.

The following circular has been issued by Mr. Reed: "The following appointments have been made, to take effect Dec. 1, 1881, and will be so recognized by all employés: Charles S. Hayden, Assistant Superintendent, with office at Manitowoc. The road from Milwaukee to Hortonville Junction, including the Two Rivers Division, will be under his supervision. David B. Curtis, Assistant Superintendent, with office at Oshkosh. The road from Oshkosh north, including the Wausau Division, will be under his supervision. Harry C. Reed, Train Dispatcher, in place of Charles S. Hayden, promoted. J. A. Snyder, Assistant Train Dispatcher."

Mobile & Montgomery.—This company has elected Josiah Morris President; M. Pratt, Vice-President; G. W. Craik, Secretary. The stock is nearly all owned by the Louisville & Nashville, and the road is worked by that company.

New York, Lake Erie & Western.—The new board has re-elected Hugh J. Jewett, President; George R. Blanchard, Robert Harris, Vice-Presidents; A. R. Macdonough, Secretary; Bird W. Spencer, Treasurer.

Mr. George H. Davis has been appointed General Yard-Master at East Buffalo. Mr. Charles A. Taylor succeeds Mr. Davis as Superintendent of Freight on the International Branch, between East Buffalo and the International Bridge.

New York & New England.—At the annual meeting in Boston, Dec. 6, the following directors were chosen: Eustace C. Fitz, Jonas H. French, Wm. F. Hart, Henry L. Higginson, James H. Wilson, Boston; Jesse Metcalf, Providence, R. I.; Frederick J. Kingsbury, Waterbury, Conn.; Le Grand B. Cannon, Sidney Dillon, Cyrus W. Field, Jay Gould, R. Suydam Grant, Hugh J. Jewett, Russell Sage, New York; George B. Roberts, Philadelphia. The new directors are Messrs. Higginson, Dillon, Field, Gould, Jewett, Sage and Roberts, who succeed Stillman B. Allen, Samuel Carleton, George P. Carter, John Goldthwait, Marshall Jewell, Thos. Nickerson and Gorham P. Pomroy.

The board elected James H. Wilson President; George B. Phippen, Treasurer; James W. Perkins, Secretary; Jas. H. Wilson, Jay Gould, Le Grand B. Cannon, Wm. T. Hart and Jonas H. French, Executive Committee.

North Pacific Coast.—Mr. J. D. Walker has been chosen President, and David Nye, General Superintendent.

Ohio Southern.—Mr. David Ennis has been appointed Assistant Superintendent. He has been for 18 years a conductor on the Erie road.

Pennsylvania.—Mr. Samuel Finlay has been appointed New England Freight Agent, with office in Boston, in place of C. W. Cook, resigned.

Pennsylvania Company.—Mr. A. B. Starr is appointed Superintendent of the Eastern Division, Pittsburgh, Fort Wayne & Chicago Railway, in place of Geo. S. Griscom, resigned, taking effect Dec. 1.

Mr. Starr has been for some time Superintendent of the Sunbury, Hazleton & Wilkesbarre and the Shamokin Division of the Northern Central.

Peoria & Pekin Union.—Mr. Thomas B. Burnett was on Dec. 1 appointed General Superintendent of this company, and took charge of the property and operation of the road on that date.

Pittsburgh & Connellsville.—At the annual meeting in Pittsburgh, Dec. 5, the following directors were chosen: George A. Berry, Wm. S. Bissell, Charles L. Fitzhugh, John D Scully, Pittsburgh; Wm. Baldwin, Connellsville, Pa.; Wm. H. Markle, Greenburg, Pa.; C. C. Markle, West Newton, Pa.; Wm. H. Koontz, Somerset, Pa.; Mendes Cohen, Robert Garrett, Hugh Sisson, Charles Webb, Baltimore. The board elected George A. Garrett President; J. B. Washington, Secretary and Treasurer. The road is worked by the Baltimore & Ohio.

Providence & Springfield.—At the annual meeting in Providence, R. I., Dec. 7, the old directors were re-elected as follows: William Tinkham, Albert L. Sayles, John L. Ross, James O. Inman, Horace A. Kimball, Sidney Dillon, Edward Pearce, Jr. William Tinkham was re-elected President.

Richmond & Petersburg.—At the annual meeting in Richmond, Va., Nov. 29 the following were chosen: President, Frederick R. Scott; directors, R. R. Bridgers, H. K. Ellyson, B. W. Haxall, D. W. Lassiter, Wm. T. Walters.

Sioux City & Pacific.—Mr. C. F. McCoy has been appointed Assistant Superintendent, with office at Blair, Neb., and will have charge of all this company's lines in Nebraska.

Southern & Atlantic Telegraph.—At the annual meeting in New York, last week, the following were chosen: President, Norvin Green; directors, Wm. H. Abel, Charles M. Fry, Arthur B. Graves, Henry Hentz, John W. Kirk, R. H. Rochester, Augustus Schell.

Toledo, Ann Arbor & Grand Trunk.—Mr. M. D. Woodford has been appointed General Manager. He was formerly on the Canada Southern, and lately has been General Manager of the Ft. Wayne & Jackson road.

Mr. M. D. Baker has been appointed Master of Transportation, with office in Toledo, O. He was recently a train-dispatcher.

West Virginia Central & Pittsburgh.—The officers are: President, H. G. Davis, Piedmont, W. Va.; Vice-President, S. B. Elkins, New York; Secretary, A. Ebert, New York; Treasurer, C. M. Hoult, Baltimore; General Superintendent, Wm. E. Porter, Piedmont, W. Va.

PERSONAL.

—It is reported that Mr. A. A. Talmage has tendered his resignation of his position as General Manager of the Missouri Pacific road.

—Mr. W. S. Mellen, Assistant General Freight Agent of the Chicago & Northwestern road, has resigned in order to accept a position on the Atchison, Topeka & Santa Fe.

—Gen. F. W. Huidekoper, who has been President and active manager of the Chicago & Eastern Illinois since the present company was formed, has resigned his position.

—With the annual meeting next week Mr. N. G. White will retire from his office as President of the Boston & Maine Company, after holding it for ten years. Mr. White has carried the company successfully through a bitter fight with the Eastern road and a long period of business depression, and now withdraws with the regret of the stockholders.

—Mr. D. P. Eels, President of the Commercial National Bank of Cleveland, and a director of the Ohio Central, the Lake Erie & Western and other roads, had a box containing $117,000 in bonds stolen from his desk by a sneak-thief while in his office conversing with a friend. Mr. Eels had just cut the coupons from some of the bonds and put them back in the box. The bonds were of the Chicago, Milwaukee & St. Paul, the Chicago & Northwestern and the Chicago & Atchison Bridge Companies. They are all negotiable.

—Mr. Henry C. Wentworth has resigned his position as General Passenger and Ticket Agent of the Michigan Central road on account of ill health. Mr. Wentworth's resignation was tendered some time ago, but was not accepted, in the hope that he might recover sufficiently to retain his position. He has been with the company for 23 years, most of the time as Western Passenger Agent, but for several years in the position which he now resigns. Mr. Wentworth is one of the best and ablest men in the passenger service of American railroads, with a long and rich experience, excellent judgment, even temper, skill in negotiations, and a high character that always commanded respect. It would be hard to exaggerate the value of the work he has done for his railroad, the fruits of which it will enjoy for many years.

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings for various periods are reported as follows:

	1881.	1880.		Inc. or Dec.	P.c.
Eleven months ending Nov. 30:					
Chi., Mil. & St. P...	$15,171,000	$11,688,802	I.	$3,482,198	29.8
Chi. & N. W.....	19,899,456	17,938,058	I.	1,961,398	10.9
Chi., St. P., Minn. & O.....	3,568,654	2,809,924	I.	758,730	27.0
Denver & R. G....	5,593,482	3,118,360	I.	2,475,122	79.4
Hann. & St. Jo....	2,050,490	2,281,756	D.	231,266	10.1
Ind., Bloom. & W.	1,479,549	1,479,736	D.	187	....
Louisville & Nash.	10,204,574	8,518,475	I.	1,686,099	19.8
Mil., L. S. & W....	543,450	369,159	I.	174,311	47.2
Mobile & Ohio....	2,727,198	1,986,249	I.	140,949	7.1
Or. Ry. & Nav. Co.	3 088,535	....		.....	....
St. L. & San Fran.	2,872,321	2,470,743	I.	401,578	16.3
Union Pacific.....	25,184,827	21,578,710	I.	3,606,117	16.7
Wab., St. L. & P..	13,187,736	11,408,786	I.	1,778,950	15.6
Month of November:					
Chi., Mil. & St. P..	$1,569,000	$1,472,037	I.	$96,963	6.6
Chi. & N. W.....	1,960.159	1,855,570	I.	104,589	5.6
Chi., St. P., M. & O.	380,733	342,894	I.	37,839	11.0
Col., Hock. Val. & Tol.....	247,382	205,530	I.	41,852	20.3
Denver & R. G....	566.819	408 562	I.	158,257	38.7
Det., Lan. & No..	120,243	107,538	I.	12,705	11.8
Gulf, Col. & S. F.	131,425	75,728	I.	55,697	73.3
Hann. & St. Jo..	214,218	207,147	I.	7,071	3.4
Ind. Bloom. & W.	160,826	157,812	I.	3,014	1.9
Louisv. & Nash..	1,051,150	929,460	I.	121,750	13.1
Mil., L. S. & W....	57,465	45,072	I.	12,393	27.5
Mobile & Ohio..	251.434	251,364	I.	70	....
N. Y. & New Eng.	242,412	210,857	I.	31,555	15.0
Ohio Southern....	30,414	....		.....	...
Or. Ry. & Nav. Co.	458.300	....		.....	...
Net earnings...	234,300	155,810	I.	78,490	50.3
St. L. & San Fran.	284.311	284.108	I.	203	0.1
Union Pacific.....	2,773,608	2.251,148	I.	522,460	24.2
Wab., St. L. & P..	1,399,555	1,161,616	I.	237,939	20.5
Third week in November:					
Chi. & Alton.....	$167,535	$190,038	D.	$22,503	11.8
Chi. & Eastern Ill.	33,806	32,545	I.	1,261	3.9
Northern Pacific..	91,079	70,192	I.	20,887	29.8
St. L., I. M. & So.	158,011	147,479	I.	10,532	7.2
Week ending Nov. 18:					
Great Western...	$105,086	$109,087	D.	4,001	3.7
Week ending Nov. 26:					
Chi. & Gd. Trunk.	$31,688	$31,669	I.	19	....

Petroleum.

Stowell's *Petroleum Reporter* gives the following statements of the production of the Pennsylvania oil regions for October, in barrels of 42 gallons:

	1881.	1880.		Inc. or Dec.	P. c.
Production.....	2,323,171	2,385,636	D.	62,465	2.6
Shipments.....	2,080,467	1,665,933	I.	414,534	24.9
Stock, Oct. 31.....	25,309,361	16,877,019	I.	8,432,342	50.0
No. of producing wells.	17,799	14,100	I.	3,699	26.2

The production for the month is about up to the monthly average for this year, but was exceeded in four months of 1880. Of the production no less than 81.4 per cent. was in the Bradford District; 10.1 per cent. in the Butler, Parker and Clarion districts; 4.8 per cent. in the Allegheny District, the other districts yielding only small amounts.

The shipments were distributed as follows:

	Barrels.	Per ct. of total.
New York.....	715,212	34.4
Philadelphia.....	245,248	11.8
Baltimore.....	73,646	3.5
Boston.....	3,591	0.2
Cleveland.....	487,572	23.4
Pittsburgh.....	211,393	10.2
Local points.....	159,473	7.7
Refined at creek refineries.....	184,332	8.8
Total.....	2,080,467	100.0

The shipments are the largest on record in October in 12 years, but were exceeded in August and September of this year.

Of the oil refined at Creek refineries (the quantity here given is the equivalent in crude oil of the refined product), 55,851 barrels were shipped to New York, 3,948 to Philadelphia, 1,999 to Baltimore, 45,073 to Boston and 77,461 to local points.

Of the stock reported Oct. 31 there were 24,729,743 barrels in pipe-line tanks, and 579,618 barrels at wells. The stock is the largest on record in any month for 12 years.

Of the shipments out of the region 640,742 barrels, or 30.8 per cent., were by rail, and 1,439,725 barrels, or 69.2 per cent., by pipe line.

Exports for the eleven months ending Nov. 28 have been, in gallons:

1881.	1880.	1879.	1878.	1877.
453,701,237	313,409,768	372,125,519	308,158,400	335,678,686

This year the exports have been 45 per cent. more than last year and 22 per cent. more than in 1879, when they were larger than ever before.

The percentage of the total exports from each port has been:

	1881.	1880.	1879.	1878.
New York.....	72.8	76.6	71.0	65.6
Philadelphia.....	21.2	17.1	19.6	21.3
Baltimore.....	3 8	4.8	6.0	11.5
Boston.....	2.2	1.2	1.6	1.1

In spite of an increase of 145,000,000 gallons in the total, the Baltimore exports are not half as great as in 1878. In that time those of New York have increased 47 per cent. and those of Philadelphia 63 per cent. Since last year, however, the gain has been greater, comparatively, at Philadelphia (43 per cent.) than at New York (37½ per cent.), and greatest at Boston (172 per cent.).

Oil has scarcely ever been cheaper, which should stimulate exports. Crude is about 80 cents a barrel (42 gallons) at the wells, and cargo lots of refined at the seaboard 7¼ cents a gallon, or $3.04 a barrel. The crude is one of the least valuable substances in proportion to weight that is transported long distances. A barrel of it weighs about 240 lbs., and equivalent prices would be 18¾ cents a bushel for corn, and $6.67 per ton (of 2,000 lbs.) for coal. The latter is of course much less valuable materially at the mines, in proportion to weight, than petroleum at the wells, but is almost the only great transportation staple that is, and it does not bear so long transportation by rail.

Chicago Lumber Traffic.

For the 11 months ending with November receipts and shipments of lumber and shingles at Chicago were:

	1881.	1880.	Increase.	P. c.
Lumber, ft.:				
Receipts.....	1,796,171,000	1,503,142,000	293,029,000	19.5
Shipments.....	1,750,887,000	1,439,261,000	311,626,000	21.6
Shingles, No.:				
Receipts.....	763,986,000	625,487,000	138,499,000	22.1
Shipments.....	827,727,000	703,306,000	124,421,000	17.7

During the month of November the lumber movement was:

November:	1881.	1880.	Increase.	P. c.
Receipts.....	192,017,000	164,208,000	27,809,000	17.0
Shipments.....	211,656,000	166,939,000	44,717,000	26.8

The increase in receipts in November was not as great as before, but in shipments the increase was much greater. Last year severe weather closing the lake interrupted receipts for a time.

Lake Superior Iron Ore.

Shipments of iron ore from the Lake Superior region up to Nov. 30 are reported by the Marquette *Mining Journal* as follows:

	1881.	1880.	Increase.	P.c.
From L'Anse.....	53,663	53,006	657	1.2
From Marquette.....	11,609	633,828	77,781	12.3
From Escanaba.....	1,459,815	1,163,791	296,024	25.4
Total...	2,225.087	1,850,625	374,462	20.2

From Marquette also there were shipped 9,884 tons of pig iron and 9 805 tons of quartz. There are reported 23,132 tons of ore delivered to local points. Of the Escanaba shipments 756,848 tons were from the Marquette District and 702.967 tons from the Monominee District.

Of the total shipments the Marquette range furnished 1,522,120 tons, or 68.4 per cent., and the Menominee range 702,967 tons, or 31.6 per cent.

Shipments from the Lake Superior ports are now closed for the season. A few more cargoes may be sent from Escanaba, but not enough to increase the total very much.

Including deliveries by rail and wagon to local furnaces, the *Mining Journal* estimates the total output of ore this year at 1,350,000 tons, against 1,987,598 tons in 18.0, an increase of 362,402 tons, or 18.2 per cent.

Special Rates—The Illinois Commission Freight Tariff.

Mr. H. H. Courtright, General Freight Agent of the Chicago & Alton, has just issued the following circular:

"Agents, shippers and contracting lines are hereby notified that all special freight rates now existing on this company's lines, whether issued from this office or by division freight agents, will expire on or before Dec. 31, 1881. The above will not cancel divisions of any through tariffs with other roads. Agents at stations where special rates are now in force will, so far as practicable, give shippers and consignees notice of the discontinuance of such rates. Applications for renewal of special rates, and for all other rates, must be made to this office."

It is stated that no special rates will be made to any shippers or manufacturers after Jan. 1, 1882, by any of the Illinois roads on account of having had to adopt the new tariff prepared by the State Commissioners. The railroad officials say they know that this action will work great hardship upon manufacturers at points on their roads who will have to meet the competition of manufacturers at other points, but they cannot afford to give these parties special rates to enable them to meet the competition of other manufacturers without laying themselves liable to prosecution for a violation of the law. Or, if they made special rates to such manufacturers, they would be compelled to make as low, and even lower, rates for all similar shipments from nearer points.

All the Chicago roads, with the exception of the Burlington, have now decided to adopt substantially the Commissioners' tariff Dec. 1, and it is quite probable that the Burlington will soon decide to pursue the same course. The adoption of the new tariff, the Burlington people say, will entail upon them a loss of at least $500,000 per annum on their Illinois business. The loss on the lumber business alone will foot up to about $125,000 per annum. The losses to the Illinois Central Railroad, the managers of this road say, will foot up to no less than $1,000,000 per annum, and as the Central pays 7 per cent. of its gross earnings to the state in lieu of taxes, the loss to the state will amount to about $70,000 per annum, or far more than the services of the Commissioners will be worth to the state or its people.—*Chicago Tribune.*

Southwestern Railway Association.

A dispatch from Chicago, Dec. 7, says: "The reorganization scheme of the Southwestern Railway Association suffered a serious set-back yesterday. The Northwestern Company insisted upon its right to withdraw at any time on 30 days' notice. The Colorado pool is therefore likely to prove short lived."

Chicago-St. Louis Passenger Rates.

The Illinois Central has issued the following notice to connecting lines: "Until otherwise advised this company will accept $4, Chicago to St. Louis, on closely-limited tickets, with the exception of the 'Davis' form, which we are obliged to exclude on account of the location of the stations on same, making it possible to seriously injure our local business."

The Chicago *Tribune* says: "The Illinois Central, like the other lines leading to St. Louis, has been selling tickets to

St. Louis at the offices in this city for $4, but connecting lines were charged the *pro rata* on the regular rate—$8.70. The Alton & Wabash have long since allowed connecting lines to make rates to St. Louis by adding $4, Chicago to St. Louis, and the Illinois Central finds it has to do the same in order to protect the business coming to it from connecting roads."

Corn Shipments from the West to the South.

A recent issue of the Chicago *Tribune* says: "Shipments of corn south continue heavy beyond parallel. Kentucky hucksters are buying direct from the farmers all over Western Indiana and Northern Illinois, and shipments would be heavier were cars to be had to move the property. Corn from points on the Indianapolis & St. Louis, the Indianapolis, Decatur & Springfield, and the Indiana, Bloomington & Western roads in coming forward to go south over Indianapolis roads, and going westward to go south over the Peoria, Evansville & Decatur and the Danville, Olney & Ohio River roads in immense quantities."

This is due to the very short crop in the South, and especially in Kentucky and Tennessee.

Southern Railway & Steamship Association.

The following circular has been issued by General Commissioner Powers:

"The Rate Committee, at its seventeenth session, unanimously adopted the following resolutions, which I communicate for information, and give notice that I will strictly enforce the same, viz:

"'*Whereas*, Many shipments are being made from various points under false description of articles, whereby lower rates are secured than should obtain on the actual property shipped,

"'*Resolved, therefore*, That when soliciting or other agents are cognizant of such false descriptions, request will be made of the proper officer for the discharge of such agent.

"'*Resolved*, That it is the duty of all receiving, forwarding and delivering agents to carefully examine and properly class all articles; and failure to do so will be considered as cognizance of false description.'

"Managers and general officers will please call the special attention of agents to this circular."

Erie Canal.

The business of the Erie Canal at Buffalo from the opening up to Nov. 30 was as follows:

	1881.	1880.	Decrease.	P. c.
Boats cleared	6,924	10,623	3,699	34.7
Tolls received	$326,152	$736,631	$410,479	55.7
Av. receipts per day	1,656	3,289	1,633	49.6

The canal opened May 17, in 1881, and April 20, in 1880, giving 27 days more navigation at the beginning of the season last year.

Coal Movement.

Coal tonnages for the week ending Nov. 26 are reported as follows:

	1881.	1880.	Increase.	P. c
Anthracite	611,014	589,644	21,370	3.6
Semi-bituminous	105,340	.....	.....	.....
Bituminous, Penna.	56,772	.....	.....	.....
Coke, Penna.	44,525	.....	.....	.....

The total coal tonnage of all kinds reported by the Philadelphia & Reading for the year ending Nov. 30 is:

	1881.	1880.	Increase.	P. c.
Railroad	8,072,440	7,179,398	893,042	12.4
Schuylkill Canal	600,447	524,988	75,459	14.4
Total	8,672,887	7,704,386	968,501	12.6

The Dayton Coal & Iron Co., employing much English capital, and having about 38,000 acres of land on the Cincinnati Southern Railroad, 36 miles north of Chattanooga, is about to make extensive improvements in its property, one of the first of which will be the erection of 50 coke ovens.

The coal tonnage of the New York state canals from the opening to Nov. 30 was as follows:

	1881.	1880.	Increase.	P. c.
Anthracite	894,590	757,070	137,520	18.2
Bituminous	201,886	186,213	15,673	8.4
Total	1,096,476	943,283	153,193	16.2

The total anthracite tonnage of the Lehigh Valley road for the fiscal year ending Nov. 30 was: 1881, 5,791,376; 1880, 4,606,415; increase, 1,184,961 tons, or 25.7 per cent.

Grain Movement.

For the week ending Nov. 26 receipts and shipments of grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantic ports have been, in bushels, for the past eight years:

Year.	Northwestern receipts.	Northwestern shipments. Total.	By rail.	P. c. by rail.	Atlantic receipts
1874	2,359,732	858,513	414,044	48.3	2,017,561
1875	3,188,540	1,917,619	1,267,584	66.1	3,038,024
1876	2,645,154	1,733,099	1,376,625	79 4	3,883,986
1877	3,101,359	1,862,944	514 990	27.7	5,480,035
1878	4,678,731	2,919,174	1,012,737	34.7	5,740,942
1879	3,865,035	2,182,321	535,628	24 5	4,641,486
1880	4,388,767	2,004,368	1,259,653	62.8	5,853,802
1881	2,564,428	2,036,895	1,351,275	66 3	3,974,307

The receipts of the Northwestern markets in the week were 1,824,000 bushels (41⅛ per cent.) less than last year and the smallest since 1874. They were 669,000 bushels less than the week before, and are the smallest since the middle of March, and the smallest of the year with the exception of four weeks in February and March, when the terrible weather kept the farmers from shipping. The shipments of these markets, however, were as large as last year, and have not been much exceeded in any corresponding week, except 1878. They were 809,000 bushels less than the week before, and the smallest since the middle of March. Last year, however, the lakes were closed half the week, while this year they were open for a week afterwards. Of the shipments this year, only 855 went by the Mississippi River. Atlantic receipts were 1,882,500 bushels (32 per cent.) less than last year, and the smallest since 1876. They were nearly the same as the week before, and fully equal to the average since the first week of October.

Of the Northwestern receipts Chicago had 43 per cent., Peoria 15.9, St. Louis 13, Milwaukee 11.8, Duluth 4 9, Toledo 4.8, Detroit 3.7, and Cleveland 2.9 per cent. The Chicago receipts are about half as great as they were a few weeks ago, when the total receipts were no larger than now. Its proportion of the total receipts naturally falls off as the close of navigation approaches: last year Chicago received 50.3 per cent. of the whole in October and 44.4 in November. This year, however, Chicago has had during the season of navigation a larger proportion than last year. For instance, it had in successive months the following percentages of the whole:

	June.	July.	Aug.	Sept.	Oct.	Nov.
1881	57.8	60.3	55.6	58.0	55.9	49 9
1880	53.1	50.1	51.2	52.1	50.3	44.4

On the other hand, during the months before the opening of navigation Chicago had 39.6 per cent. of the whole last year, and only 34.4 this. Milwaukee's receipts did not decline with Chicago's, but in this week ending Nov. 26 last were the largest since October, and the largest proportion of the whole it has had since January. Toledo shows a large decrease and the smallest receipts since it was blocked by floods in February—only about a sixth of its receipts in the corresponding week of last year. St. Louis' receipts, with the exception of one week in February, were the smallest of the year, and were less than Peoria's, which has happened two or three times before this year.

Of the Atlantic receipts, New York had 66.8 per cent.; Baltimore, 10; Boston, 9.8; Philadelphia, 6.4; Portland, 3.9; New Orleans, 2.5, and Montreal, 0.6 per cent. This week the receipts of Montreal virtually cease, and those of its winter-port, Portland, fairly begin. The latter's receipts are about as much as in the three *months* previous, while Montreal's are only one-eighth of its average in October. The other changes are not notable. New York's receipts are an unusual proportion of the whole, as they have been for some weeks, although its receipts by canal have been exceptionally small.

Exports from Atlantic ports for five successive weeks have been:

	Week ending. Nov. 30.	Nov. 23.	Nov. 16.	Nov. 9.	Nov. 2.
1881.					
Flour, bbls.	68,197	59,855	80,671	42,202	39,620
Grain, bu.	2,196,395	2,154,163	2,473,746	1,841,120	1,898,996
1880.					
Flour, bbls.	101,826	142,442	112,622	120,806	92,893
Grain, bu.	3,602,963	4,112,718	4,692,993	4,701,048	5,072,436

For the eight weeks ending Nov. 30 the exports have been for two years:

	1881.	1880.	Decrease.	P. c
Flour, bbls.	456,383	889,334	432 951	48.6
Grain, bu.	18,629,106	39,139,139	21,009,973	54.0

The decrease, it is seen, has been enormous.

For the week ending Dec. 2 receipts and shipments at Chicago and Milwaukee were:

	Receipts. 1881.	1880.	Shipments. 1881.	1880.
Chicago	1,671,100	2,325,783	1,244,790	947,808
Milwaukee	402,025	557,441	133,736	227,010
Both	2,073,825	2,913,224	1,378,526	1,174,818

The decrease (29 per cent.) in receipts is less than for some weeks previous (because receipts fell off greatly at this time last year), and there is even an increase (17 per cent.) in the shipments, the latter due to the fact that the lakes were closed last year in this week, but open this year—though lake shipments almost ceased.

Receipts and shipments at Buffalo for the week ending Dec. 2 were:

	Receipts. 1881.	1880.	Shipments. 1881.	1880.
By water	447,000	773,500	.....	.....
By rail	344,900	483,500	656,500	952,300
Total	791,100	1,217,000	656,500	952,300

There is a decrease of 35 per cent. in the receipts and 31 per cent. in the shipments. The canal was closed by ice last year. This year it was open, but there were no shipments by it. The arrivals by lake last year were of vessels that left before the upper lakes were closed. There may be some small receipts by lake for another week, and possibly there will be shipments from Detroit or Toledo.

Receipts at four Eastern ports for this week ending Dec. 2 were:

	New York.	Boston.	Phila.	Baltimore.	Total.
1881	1,582,236	457,074	202,150	389,339	2,630,799
P. c. of total	60.1	17.4	7.7	14.8	100
1880	2,074,239	478,606	549,100	1,144,033	4,245,978
P. c. of total	48.9	11.3	12.9	26.9	100.0

In the face of the large general decrease the receipts of Boston were well maintained. Those of New York are unusually light, but are a much larger proportion of the whole than last year. Baltimore loses 66 per cent. and Philadelphia 63 per cent.

Of the New York receipts 838,214 bushels, or 53 per cent., arrived by rail, against 1,378,941 bushels, and 66⅔ per cent., last year.

Buffalo grain receipts up to Nov. 20 are reported as follows, flour in barrels and grain in bushels:

	Flour. 1881.	1880.	Grain. 1881.	1880.
By lake	952,033	1,305,688	56,229,941	104,726,835
By rail	830,400	844,700	29,881,200	30,772,300
Total	1,782,433	2,150,388	86,111,141	135,499,135
Per cent. by rail	46.6	39.3	34.7	22.7

The very large decrease in receipts is seen to be almost entirely in lake receipts, the railroad receipts falling off only a trifle. Shipments eastward of grain received by lake were:

	1881.	1880.	Decrease.	P.c.
By canal, bushels	31,038,421	71,850,695	40,812,274	56.9
By rail	21,272,356	28,176,670	6,904,314	24.5
Total	52,310,777	100,027,365	47,716,588	47.7
Per cent. by rail	41.6	28.2	.....	...

The canal opened May 17 this year and April 20 last year.

Baltimore grain receipts in November were as follows, flour in barrels and grain in bushels, flour being reduced to wheat in the totals:

	1881.	1880.	Inc. or Dec.	P.c.
Flour	105,468	151,196	D. 45,728	30.3
Wheat	1,115,265	4,196,279	D. 3,081,014	73.4
Corn	547,652	1,419,956	D. 872,304	61.4
Other grain	181,531	121,023	I. 60,508	50.0
Total grain	1,844,448	5,737,258	D. 3,892,810	67.8
Total, flour reduced to wheat	2,371,788	6,493,238	D. 4,121,450	63.5

Other grain this year included 61,403 bushels oats, 15,907 bushels rye and 104,221 bushels barley.

Exports for the month were 38,389 barrels and 2,000 bags flour, 929,905 bushels wheat and 439,361 bushels corn.

Chicago and Milwaukee Receipts.

For the first week of November receipts have been for four successive years:

	1878.	1879.	1880.	1881.
Chicago:				
Grain, bu.	1,908,440	1,972,778	2,681,853	1,610,074
Flour, bbls	97,320	107,623	148,741	88,182
Hogs, No.	261,935	251,903	237,524	249,041
Milwaukee:				
Grain, bu.	897,285	709,017	719,291	372,676
Flour, bbls	63,000	68,063	46,661	54,945
Hogs, No.	43,376	38,911	40,763	43,764

Reducing flour to grain, the receipts of grain at both places have been:

	1878.	1879.	1880.	1881.
Bushels	3,621,647	3,472,384	4,280,453	2,626,821

Thus the average receipts are nearly 40 per cent. less than last year and 24⅛ per cent. less than in 1879.

The Allan Line Steamers.

A dispatch from Boston, Nov. 25, says: "With the sailing of the 'Manitoban,' for Glasgow, and the 'Sarmatian,' for Liverpool, began the winter programme of the Allan Company. Three steamers will run from Boston, and there will be four sailings every six weeks. From Portland the company will send a steamer to Glasgow once every three weeks, and once every two weeks to Liverpool. An arrangement has been made with the Grand Trunk Railroad Company to take freight from Portland, and a new elevator will be built in that city by the Grand Trunk Company. From Boston the steamers will be the 'Circassian,' the 'Sardinian,' and the 'Peruvian.'"

THE SCRAP HEAP.

An Iowa Train Robbery.

The passengers on the Chicago, Rock Island & Pacific train which left Council Bluffs Wednesday evening at 5:20 o'clock, and arrived in Davenport Thursday morning, were thrown into a state of confusion when about twenty miles out and near Weston Station, by three unmasked men snatching from the hand of a passenger his pocket book containing $175, and drawing revolvers, threatening to shoot any person who came near them. This over, they coolly rang the bell and stopped the train. They then walked out upon the platform, leaped to the ground and walked away in the darkness. The cry of "The James brothers!" and that the train was being robbed caused the hasty bestowal of the passengers' valuables beneath cushion seats, down boot legs, under collars, and in every available hiding place. No attempt was made to follow the robbers, and the train was moved on without further molestation, although the efforts of the conductor were fruitless to quell the excitement until the station was reached and the passengers were convinced they were not to be murdered. There was nothing to have prevented the robbers from going through the whole train, as everybody was too badly frightened to make any move toward resistance. The opinion seems to be that they intended to do this, but became frightened at something, and, being novices in the business, made off with what they had secured. News was telegraphed to all stations in the vicinity, and every effort will be made for their capture.—*Davenport (Ia.) Gazette, Nov.* 19.

Handsome Passenger Cars.

The shops of the Chicago & Alton road, at Bloomington, Ill., have just turned out three day coaches which are the finest of this class the road has ever built. The bodies are 50 ft. 6 in. long and 9 ft. 8 in. wide over sills, and seat 58 passengers. The ceilings and inside panels are of red oak, with black walnut moldings throughout. The windows have fixed and sliding sashes, with glass 20 in. wide, the length of both panes being 35½ in. Hartshorn rollers are used instead of blinds. The seats are upholstered in cherry silk plush. At one end of the car is the ladies' toilet, and at the other the gentlemen's saloon. The cars have four-wheel trucks and 42-in. Allen paper wheels, with 8 ft. wheel base. The outside is painted dark brown, relieved with gilt ornamentation, which is the standard style for the road. The shops are also building two cars which are to have reclining chairs; also a new dining car, and rebuilding five coaches, two baggage and one mail car. Four 20-ton coal cars are also turned out per day. The end gates have eye-bolt hinges, and drop inwardly, so that lumber can be carried. The sides are 28 in. high from the floor. After 100 of these are finished a lot of stock cars will be built.—*National Car-Builder.*

OLD AND NEW ROADS.

Arkansas Midland.—The suit to set aside the foreclosure by which this company came into possession of its road, formerly the Arkansas Central, is now on trial in the United States Circuit Court at Little Rock. Plaintiffs in the suit allege fraud and collusion in the foreclosure.

Atlantic & Pacific.—At a meeting of directors, held in New York, it was resolved that the construction by the most practicable route of all that portion of the road situated between San Francisco and the Colorado River, at or near the Needles, be prosecuted vigorously until the whole line from the Rio Grande to the Pacific is put into operation. The financial plan previously approved by the Atchison, Topeka & Santa Fe Railroad and the St. Louis & San Francisco Railroad for the prosecution of this work and the resumption of work on the Central Division was approved, and orders given to carry out the same. The purchases of rails and ties for the California Division were reported, and additional expenditures authorized. The location of 62 miles of the Central Division west from the Vinita line was approved and its construction authorized.

Baltimore, Cincinnati & Western Central.—The Baltimore, Cincinnati & Western Company has begun a suit against this company and Charles E. Ertz, to enjoin the company from continuing to use its present name, and also from representing that it has succeeded to the franchises and property of the Baltimore, Cincinnati & Western Company. It is charged that Mr. Ertz left the old company and was chiefly instrumental in forming the new one, and that he is really acting for the Baltimore & Ohio Company, and does not intend to build the proposed road, but rather to delay or prevent its construction.

Bangor & Katahdin.—The track on this road is now all laid, and freight trains began to run over it Dec. 5. The road is 19½ miles long, extending from Milo, Me., on the Bangor & Piscataquis road, northwest to the Katahdin Iron Works. A large quantity of lumber has been cut recently, and is waiting for the road to carry it out.

Boston, Lowell & Concord.—The attorneys in the suit to enjoin the contract between the Boston & Lowell and the Concord companies have filed their brief. They ask for an injunction on the ground that the contract is invalid, being (1) violative of the charter of the Concord Railroad; (2) violative of the public laws of New Hampshire; and (3) *ultra vires* of the directors of the Concord Railroad. If either point is sustained, an injunction should issue. The real question involved in the motion is: Were the directors of the Concord Railroad on Aug. 19, 1881, vested with power to bind the Concord Railroad in the execution of this contract? If such power exists, nothing further is required or can be done; but if it cannot be found the contract should be at once restrained by the Court.

Buffalo, New York & Philadelphia.—The Buffalo *Express* of Dec. 5 says: "The stockholders of this road held a meeting on Saturday morning at the general offices of the company in this city. Representatives of the syndicate owning it were present, and by the payment of the last installment on the purchase price of the road, acquired full ownership of its property and interests. This syndicate is composed of J. & W. Seligman; Drexel, Martin & Co.; Kidder, Peabody & Co.; Clark, Post & Morgan and E. W. Clark & Co. The price paid for the road is $4,850,000. Twenty per cent. of the purchase money was paid down last April, when the transfer was made, and according to terms then made the balance was to be paid in monthly installments. Mr. Sherman S. Jewett resigns from the presidency of the road, and is succeeded by Mr. Bronson C. Rumsey of this city."

Arrangements have been finally completed for the transfer of this road and its narrow-gauge branches in the Bradford oil region to the Buffalo, Pittsburgh & Western Company, which is owned by the same syndicate which lately

bought this road. The two roads will have the same management and will be operated as one line.

Buffalo, Pittsburgh & Western.—It is announced that a contract has been concluded between this company and the Baltimore & Ohio for an exchange of business to and from Buffalo and other points reached by this road. The contract requires the completion of the line surveyed some time ago from New Castle, Pa., westward to the Baltimore & Ohio at Chicago Junction, O., 135 miles, and will also require an extension of this company's New Castle & Franklin road from Stoneboro to Oil City, about 20 miles. A company to build the line from New Castle to Chicago Junction was organized last spring.

Central, of New Jersey.—It is announced that a second track is to be laid over the whole of the Long Branch Division in time for next season's business. To pay for this and other improvements an issue of bonds will probably be made by the New York & Long Branch Company, which owns the line south of Perth Amboy. Arrangements will be made as soon as possible for carrying out the agreement under which the Pennsylvania Railroad Company secures the joint use of the tracks of this division from Bay Head to Long Branch.

Central Tunnel.—This company has filed articles of incorporation to build an underground or tunnel road from the City Hall to the Grand Central Depot, in the city of New York.

Central Vermont.—The St. Albans (Vt.) *Messenger* of Dec. 2 says: "Chancellor Royce Tuesday filed his formal decree in the Langdon case. By it the Vermont & Canada Railroad and the Vermont Central Railroad are ordered to pay to the clerk of the Court for the benefit of the holders the various loans included under the name of the trust debt and including first equipment bonds, $3,196.36; income and extension bonds, $288,821.66; second equipment bonds, $410,729.20; third equipment bonds, $235,744.60; third equipment bonds (second issue), $217,328.20; income and extension bonds not stamped, $469,261.68; guaranteed bonds, $384,480.96; and Chambly bonds, $144,369.99, all with interest from Nov. 1, 1881; floating debts proved before masters, $503,750, with interest; for Grand Trunk Railway Company, $547,973.69, with interest from Dec. 31, 1880, less $10,000 and same interest, all on or before Nov. 26, 1882, and all sums becoming due hereafter of principal and interest on above. In default of such payment, defendants to be foreclosed on all equity redemption in the property above held, subject to said claims; and they are ordered to deed and release all title in the same to W. H. H. Bingham, of Stowe, in trust for the orators and such other trust creditors as may be entitled The claims of the Central Vermont Company are dismissed without prejudice on the objection of the Vermont & Canada Company, because its accounts as receiver and manager are unsettled."

Chester, Iron Mountain & Western.—It is announced that arrangements have been completed to build this road from the Mississippi opposite Chester, Ill., by Iron Mountain and the Nova Scotia mines to Salem, Mo. Work is to be begun at once.

Chester & Lenoir.—Work has been in progress for some time on the extension of this road from Lincolnton, N. C., to Newton and Lenoir. Track has been laid from Lincolnton north, five miles, and is advancing steadily.

Chicago, Milwaukee & St. Paul.—The State Treasurer of Wisconsin has made formal demand on this company for the balance of license tax due for 1881. The company declines to pay until certain questions in dispute are settled. There is a dispute between the company and the state as to the right of the latter to levy a tax of 4 per cent. on lines which do not earn enough to put them in the first class, and the company withholds $14,000 as difference between what the state demands and what the company thinks it ought to pay. The company will apply to the Legislature for an adjustment of the matter, a recent decision of the courts being apparently against it.

It is said that the Farley Branch will shortly be extended from Farley, Ia., to Dubuque.

Chicago, Texas & Mexican.—Track is reported laid on this road from Dallas, Tex., southwest to Cedar Hill, 18 miles. Grading is completed for some distance further.

Cincinnati, Green River & Nashville.—This road is now completed from King's Mountain, Ky., on the Cincinnati Southern road, westward to Grove City, 12 miles. Work is progressing on the road, which is intended to run to Glasgow.

Cleveland, Mt. Vernon & Delaware.—The bondholders who bought this road at foreclosure sale met in Cleveland, O., Dec. 1, and organized the Cleveland, Akron & Columbus Company. It is understood that there will be no immediate change in the relations of the road, though the New York, Pennsylvania & Ohio Company is represented in the board.

Credit Valley.—It is reported that negotiations have been concluded in London for the transfer of this road, now completed from Toronto to St. Thomas and Ingersoll, Ont., to the Great Western Company. The object of the purchase is the removal of local competition chiefly. It is said also that the agreement between the two companies provides for the completion of the Toronto & Ottawa road by the Great Western, and also a lease of the Quebec, Montreal, Ottawa & Occidental, thus completing a line to Montreal and Quebec in close competition with the Grand Trunk.

Danville & New River.—This road was formally opened last week from Danville, Va., west to Cascade, 22 miles, by an excursion over the road, with a collation, speeches, etc. The road is of 3 ft. gauge, and has grades as high as 166 ft. to the mile. Work is in progress from Cascade westward; the road is intended to run through to the Norfolk & Western at New River, 80 miles from Danville.

Delaware, Lackawanna & Western.—Surveys have been made for a branch from this company's Utica Division to the Kirkland furnaces, near Clinton, N. Y., about three miles.

Denver & Rio Grande.—The Eagle River Branch has been extended from Eagle Park, Col., to Red Cliff, five miles, making the branch 25 miles long from Malta to Red Cliff.

The Crested Butte Branch has been completed from Gunnison, Col., northwest to Crested Butte, 28 miles, and is now open for business.

Dover & Rockaway.—This road is now completed and in operation. It extends from Port Oram, N. J., eastward by Dover to Rockaway, about five miles. It is an extension of the New Jersey Central's High Bridge Branch and is worked by the Central as part of that branch. It reaches several valuable iron mines.

East Tennessee & Western North Carolina.—This road is now completed to Hampton, Tenn., 8 miles eastward from the late terminus at Elizabethton, and 15 miles from the junction with the East Tennessee, Virginia & Georgia at Johnson. Work is progressing towards Cranberry, N. C., 19 miles beyond Hampton.

Flint & Pere Marquette.—Track on the Manistee Branch is now laid to Stronach, Mich., at the head of Manistee Lake, 18 miles northwest of Webber, and 22 miles from the main line at Butler Junction. About three miles more are to be laid to reach Manistee. Passenger trains began to run to Stonach Dec. 5, and a ferry-boat runs from that place to Manistee.

Grand Rapids & Indiana.—The contract for grading the extension of this road from the present northern terminus at Petoskey, Mich., to the Straits of Mackinaw has been let to McDonald Brothers, of Grand Rapids, and L. A. Rose, of Bronson, Mich. The work is to be completed by June 15 next.

Green Bay, Winona & St. Paul.—Notice is given that the securities of this company are now ready for delivery by the Farmers' Loan & Trust Company in New York in exchange for the receipts issued for Green Bay & Minnesota and Green Bay & Lake Pepin securities deposited in accordance with the agreement of reorganization.

Gulf, Colorado & Santa Fe.—The track of the Ft. Worth Branch on Dec. 2 reached Ft. Worth, Tex., 30 miles northward from the late terminus at Cleburne, 129 miles from the main line at Temple Junction and 347 miles from Galveston. Trains will begin to run through to Ft. Worth about Dec. 15.

Indiana, Bloomington & Western.—Track on the Eastern Extension is now laid to Newcastle, Ind., 45 miles eastward from Indianapolis. From Springfield, O., eastward to Troy, 25 miles, the grading is finished, and a large force is at work on the grade between Troy and Newcastle, about 65 miles.

Indianapolis, Decatur & Springfield.—At meetings held in New York this week an agreement was completed for the lease of this road to the Indiana, Bloomington & Western Company, the rental to be 30 per cent. of the gross earnings, the lessee guaranteeing a minimum of $200,000 yearly. The road extends from Indianapolis west to Decatur, Ill., 153 miles, and is to be extended by the lessee to Roodhouse, to connect with the Chicago & Alton road to Kansas City and St. Louis.

Indianapolis & Evansville.—Track is reported laid from Washington, Ind., on the Ohio & Mississippi road, south by West to Petersburg, about 11 miles. This is the first track laid on this road.

Jacksonville, Tampa & Key West.—The Jacksonville (Fla.) *Union* reports that the early building of this road is assured and that Jay Gould, Samuel J. Tilden, Governor Cornell, Winslow, Lanier & Co.; Milton Weston, of the Chicago Belt Line Railroad, and other capitalists have taken the matter in hand, and will push the road to completion. The road will run on the west side of the St. Johns River to Palatka, and thence direct to Tampa. A steam ferry is to be established from Palatka to a point on the opposite side of the river, and a road run from there to Titusville, a distance of over 100 miles. The project also includes a branch to a point in South Florida with a steam ferry to Key West.

Knox & Lincoln.—Negotiations are reported in progress for a lease of this road to the Maine Central Company. It extends from Bath, Me., to Rockland, 48 miles, and is owned chiefly by the towns on the line.

Marietta & Cincinnati.—The Bondholders' Committee has had several conferences with representatives of the Baltimore & Ohio, and it is reported that a plan of reorganization has been agreed on, which provides for the issue of a new low-rate bond, guaranteed by the Baltimore & Ohio Company for the principal and back interest of the present first-mortgage bonds. No provision, as yet, has been made for the junior mortgages.

Milwaukee, Lake Shore & Western.—The Northern Extension is now completed to Summit Lake, Wis., six miles northward from the late terminus at Kempster and 225 miles from Milwaukee. On Dec. 5 trains began to run to the new terminus.

Mobile, Clarksville & Evansville.—This company has filed articles of incorporation in Tennessee to build a railroad across that state from the Kentucky line in Montgomery County to Clarksville, and thence to the Alabama line north of Florence, Ala. The proposed line is nearly due north and south and about 115 miles long. The incorporators are J. E. Bailey, C. G. Smith, James D. Neblett and D. N. Kennedy.

Mt. Sterling.—It is reported that this road has been sold to the Chesapeake & Ohio Company, and that it will be changed from 3 ft. to standard gauge and extended. It is a coal road and is now in operation from Mt. Sterling, Ky., to Cornwell, 20 miles.

New Bonds.—Several issues of new bonds have lately been put upon the market in New York:

Canadian Pacific bonds to the amount of $10,000,000 (out of an issue of $25,000,000) are offered by J. S. Kennedy & Co., of New York, and the Bank of Montreal. They are first-mortgage 5 per cent. bonds, having 50 years to run, and the mortgage is secured upon the land grant in Manitoba and the Northwest territory as well as on the road.

The *Chesapeake & Ohio* offer through Fisk & Hatch, of New York, $2,000,000 first-mortgage bonds on the Peninsula Extension of 75 miles from Richmond to Newport News. The bonds bear 6 per cent. interest, have 30 years to run, and are offered at par and accrued interest from Oct. 1.

Subscriptions for *Duluth & Winnipeg* first-mortgage 6 per cent. bonds to the amount of $5,000,000 will be received by Boody, McLellan & Co., of New York, until Dec. 12. The projected line is from Duluth, Minn., to Winnipeg, Manitoba, and is north of the Northern Pacific; the bonds are at the rate of $18,000 per mile. They are offered at 102½ and interest, each subscriber to receive as a bonus income bonds to the amount of 40 per cent. of the first-mortgage bonds taken.

New York, Lackawanna & Western first-mortgage 6 per cent. bonds, having 40 years to run, are offered by Moses Taylor & Co., of New York. The road is the Delaware, Lackawanna & Western's extension from Binghamton to Buffalo, now under construction.

New Brunswick.—The track of the Aroostook Branch is now completed to Presque Isle, Me., about 10 miles southward from the late terminus at Caribou, 29 miles from the main line at Aroostook, N. B., and 132 miles from Gibson. Regular trains begin running to Presque Isle this week.

New Orleans, Red River & Texas.—This company was recently organized to build a narrow-gauge railroad from New Orleans up the east side of the Mississippi to the mouth of Red River; then, across the river, westward to the Sabine and, by way of Nacogdoches, to Palestine, Tex. The proposed line is about 370 miles long.

New York & New England.—At the annual meeting Dec. 6 the expected transfer of this road was made, a Gould board being chosen without opposition. A few of the old Boston directors were retained.

The stockholders unanimously adopted the following:

"*Whereas*, this company now has a completed unbroken line of rails from Boston and Providence to the Hudson River, constituting one of the most valuable railroad properties in the United States, and

"*Whereas*, this road cannot adequately serve its patrons, nor promote the commerce of Boston, upon which its success so largely depends, without facilities in every respect equal to those of its rivals. And,

"*Whereas*, The passenger business is one of the most profitable elements of the railroad carrying trade, between Boston and Providence and New York city, and to secure and retain a fair proportion of this business, requires the control of a continuous double track railroad for the entire distance, under one management.

"*It is therefore voted*, That the board of directors of this company are hereby requested to take measures to secure to this company, either by lease, purchase or construction, such a line of railroad from some point on the completed road of this company to New York city."

It was voted that the board just elected choose four additional directors, so that the board shall consist of 19 members.

New York, Pennsylvania & Ohio.—The South Shore Freight line, which formerly sent its cars by way of Buffalo and the Lake Shore road, now runs over this road from Salamanca.

Norfolk & Virgina Beach.—This company purposes building a railroad about 20 miles long from Norfolk, Va., to the Hollies, on the Atlantic shore, about five miles below Cape Henry. The company has secured a large estate on the shore at this point, and will build a hotel and other buildings for a summer resort.

Northern Pacific.—Track on this road is now laid to Ft. Keogh, Montana, three miles beyond Miles City and 81 miles westward from the late terminus at Glendive, 771 miles from St. Paul and 793 miles from Duluth. Regular trains will be put on as soon as the track reaches the end of the division at Forsythe, 17 miles beyond Ft. Keogh.

Ohio Central.—Work is progressing actively on the extension of this road from Corning, O., southward to Athens, about 19 miles. From Athens the survey and location of the line to Pomeroy on the Ohio River have been completed. Contracts have also been let for the grading of the Sunday Creek Branch.

Ohio & Mississippi.—Receiver Douglas reports to the Court for November as follows:

Balance, Nov. 1	$162,606.06
Receipts from all sources	514,814.44
Total	$677,420.50
Disbursements	448,372.19
Balance, Dec. 1	$229,048.31

Receipts exceeded the disbursements by $66,444.25. Payments included $70,000 coupons on first-mortgage bonds due Nov. 1.

Oregon & Nevada.—This company has been organized to build a railroad from Callville, Nev., on the east side of the Colorado to Yuma, with an extension to Port Ysabel at the head of the Gulf of California. The company also purposes owning and running steamers from Port Ysabel to other ports in Mexico and California.

Pennsylvania.—It is reported that this company has bought the North & West Branch road and will complete it from Wilkesbarre to Catawissa as an extension of its Sunbury, Hazleton & Wilkesbarre Branch.

It is stated that the West Pennsylvania Division is to be extended from Blairsville, Pa., along the north side of the Conemaugh to Bolivar on the main line, a distance of about seven miles. This will make a loop or second line from Blairsville Intersection to Bolivar.

This company's Philadelphia & Long Branch line, which is now completed to the junction with the Central Railroad of New Jersey at Bay Head, N. J., is 27.5 miles long from Whiting's, the end of the Pemberton & Sea Shore road. It is operated in connection with the Amboy Division, and completes a line from Camden by Pemberton and Sea Side Park to Bay Head, 70 miles long. From Bay Head to Long Branch, about 18 miles, the Pennsylvania trains will use the Central tracks, under the agreement recently noted.

The Philadelphia *North American* of Dec. 5 says: "The Broad street station will be used from to-day for all trains which up to this time have been arriving and departing to and from the West Philadelphia depot. The new régime begins at six o'clock this morning. It is expected that all way trains over the elevated road will stop at new stations at Twenty-first and Powelton avenue. There will be a number of changes in the running of local trains, and the running time of some of the New York trains will be slightly changed. The work of erecting the new station was begun less than two years ago; accounts have been published from time to time as it progressed. The lower story is built of massive blocks of rough-dressed Fox Island granite, with an open arcade upon the Merrick-street front, supported on polished granite columns. The main floor of the building is on a level with the elevated track, and the walls above the granite base are built entirely of smooth pressed brick and terra-cotta. The clock tower at the northeast angle rises to a height of 176 ft. The space below set aside for the carriage-ways is flanked on the Filbert street side by the main entrance to the station, and on the Market street side by the main exit. Elevators will carry the passengers to the second floor. The space fronting on Merrick street is divided into two large rooms, that on the north side being the waiting-room and that on the south a dining-room. Dressing-rooms, bath-rooms and a barber shop are also provided. The kitchen, pantries and store-rooms are on the third floor. The rooms on the fourth floor are occupied entirely by officers of the railroad company. The interior decorations of the building are very lavish. The floors are of marble, and the furniture of oak and ash, heavily carved in Gothic designs. The rear of the building joins the train platform, upon which the doors of the main waiting-room open. The ground floor under the tracks, which is supported on iron girders and columns, is devoted entirely to receiving and discharging freight. Only the best material has been used, and as the buildings are almost entirely composed of stone, brick and iron, they are considered practically fire-proof. The mails which will leave the station will be closed at the post-office 15 minutes later than formerly. In 1851 the passenger station of the road was at the southwest corner of Oak (now Merrick) and Market streets, the site at present occupied by the Third National Bank. The cars were drawn by horses out Market street and over the bridge to West Philadelphia, where the locomotive was attached. After leaving Oak and Market streets it was removed to Eighteenth and Market, thence to Eleventh and Market, thence to Thirtieth and Market streets, and finally to Thirty-second street, where it has been for about six years. It will thus be seen that about 30 years ago the Pennsylvania Railroad Company's passenger depot was opposite to the structure which it is occupying to-day."

Port Huron & Northwestern.—The extension of the Marlette Branch to East Saginaw, Mich., is now completed from Marlette to Vassar, 26 miles, leaving about 20 miles to be completed. The crossing of the Detroit & Bay City road at Vassar has been put in, and work is in progress on the tracklaying beyond that point.

St. Louis, Hannibal & Keokuk.—This road has lately been extended from its late terminus at Eolia (formerly Prairieville), Mo., southward to Silex, 10 miles. The road is now 59 miles long, from Hannibal to Silex.

St. Louis, Iron Mountain & Southern.—The Louisiana Branch is now completed and opened for business to Camden, Ark., 16 miles beyond the late terminus at Chidester, and 34 miles southeast from the main line at Gurdon. Work is progressing from Camden southward.

St. Louis & San Francisco.—The track on the Arkansas Division is now laid from Brentwood, Ark., 18 miles southward from the late terminus at Fayetteville, and 88 miles from the junction with the main line at Plymouth, Mo. The road is nearly completed four miles further, to Winslow at the foot of the Boston Mountains.

St. Paul, Minneapolis & Manitoba.—This company has had organized in its interest the Minneapolis Union Company, to build one or more tracks from the Union Stock Yard, near St. Paul, to Minneapolis. The road is to be part of this company's new short line, from St. Paul to Minneapolis.

On the line up the west side of the Red River Valley track is now laid from Grand Forks, Dak., northward to Minto, 31 miles. The intermediate stations are Pearson, 6 miles from Grand Forks; Turtle River, 13; Levant, 20; Kimball, 24 miles. This is an extension of the Grand Forks, Fargo, & Barnesville Branch, and is to run northward to the Manitoba line. The new line is across the river from the old one to St. Vincent, and some miles away.

Salina & Northwestern.—This company has been organized to build a branch of the Kansas Pacific from Salina, Kan., to Lincoln Centre and thence to the Nebraska line.

Texas & Pacific.—Track was laid on Dec. 1 to the junction with the Southern Pacific (or, more correctly, the El Paso Division of the Galveston, Harrisburg & San Antonio), at Sierra Blanco, Tex., 92 miles east of El Paso. This junction is 27 miles westward from the Cariso Pass and 751 miles from Texarkana, making, if the distances are correctly stated in the dispatches, the distance to El Paso 843 miles from Texarkana and 1,333 miles from St. Louis, and the entire distance from St. Louis to San Francisco, by the line thus completed, 2,619 miles.

Topeka & Pawnee City.—This company has been organized to build a railroad from Pawnee City, Neb., south by east to Topeka, Kan., about 80 miles. Surveys are in progress.

Toronto, Grey & Bruce.—The gauge of this road from Toronto, Ont., to Owen Sound and from Orangeville to Teeswater, 195 miles in all, was changed on Dec. 3 from 3 ft. 6 in. to 4 ft. 8½ in. Preparations for the change have been in progress for several months.

Union Pacific.—This company makes the following statement for the month of September:

	Earnings.	Expenses.	Net earnings.
Union Division	$1,827,581	$623,908	$1,203,673
Union Branches	382,084	219,998	162,686
Kansas Division	661,805	282,752	379,053
Kansas Branches	108,273	57,371	50,902
Denver & South Park Division	139,106	145,378	*6,272
Total	$3,119,449	$1,329,407	$1,790,042

* Deficit.

The total expenses were 42.62 per cent. of the gross earnings.

Virginia Railroad Valuations.—The Richmond *State* says: "The Auditor of Public Accounts has just issued a statement showing the value of the real and personal property of railroad companies in Virginia, as ascertained and assessed by the Board of Public Works on Sept. 28, 1881, from the reports made June 1, 1881, to the Auditor of Public Accounts, pursuant to sections 20 and 21 of the act for the assessment of taxes on persons, property, income, licenses, etc., and imposing taxes thereon, for the support of government and free schools and to pay the interest on the public debt; approved March 27, 1876, as amended by the acts approved March 13 and March 20, 1877.

The following shows the total value of all property, real and personal, of the railroads named in the statement:

Alexandria & Fredericksburg	$520,394.00
Alexandria & Washington	91,200.00
Brighthope	121,000.00
Charlottesville & Rapidan	423,000.00
Chesapeake & Ohio	3,953,641.00
Elizabeth City & Norfolk	405,600.00
Franklin & Pittsylvania	151,250.00
Milton & Sutherlin	19,500.00
Norfolk & Ocean View	63,200.00
Norfolk & Western	7,595,751.00
Petersburg	719,986.34
Piedmont	109,100.00
Potomac	32,800.00
Potomac, Fredericksburg & Piedmont	92,150.00
Richmond & Alleghany	1,913,336.41
Richmond (City Street)	26,000.00
Richmond, Fredericksburg & Potomac & Richmond & Petersburg Connection	63,100.00
Richmond & Petersburg	421,500.00
Richmond, York River & Chesapeake	791,140.00
Seaboard & Roanoke	1,618,450.00
Shenandoah Valley	1,207,200.00
Strasburg & Harrisonburg	742,600.00
Tuckahoe & James River	11,250.00
Valley	392,750.00
Virginia Midland	4,710,500.00
Washington and Ohio	281,775.00
Winchester & Potomac	167,000.00
Winchester & Strasburg	286,000.00

"The total value of all railroad property in the state was as follows:

Roadway and track	$23,133,375.00
Depots, depot grounds and lots, station buildings and fixtures and machine shops	611,470.34
Real estate not included in other classes	427,700.00
Rolling stock, including passenger, freight, cattle, stock, baggage, mail, express, sleeping, palace, parlor, and all other cars owned or belonging to the company, boats, machinery and equipment	2,497,806.00
Stores	88,662.41
Telegraph lines	16,060.00
Miscellaneous property	165,100.00
Total value of all property, real and personal	$26,940,173.75
Total tax on real and personal property at 50 cents on the $100 value	134,700.87
Net income	351,301.35
Tax on net income at 1 per centum	3,513.01
Total tax	138,213 88

"The railroads not included in the statement are not taxable for the year 1881."

Virginia Midland.—At a meeting held in Alexandria, Va., Nov. 29, the trustees reported that, in pursuance of the agreement of reorganization they had issued $800,000 common stock, $1,500,000 first-preferred stock, $2,500,000 second-preferred stock, and $7,635,000 in bonds of the new company. All the securities of the old company had been retired and all claims adjusted except one for $64,000 held by the Baltimore & Ohio, which would be settled by a transfer of bonds; the sum of $50,000 had been deposited for the redemption of a few bonds which could not be found. After completing the settlement the trustees would have a surplus of about $900,000 in bonds, which would be turned into the treasury of the company. The report of the trustees was accepted and a committee was appointed to make a final settlement with them.

The stockholders voted to authorize the issue of $4,000,000 income bonds to be issued in exchange for the first and second-preferred stock.

They also voted to authorize a subscription of $250,000 to the stock of the North Carolina Midland Company.

The board of directors of the Richmond & West Point Terminal Railway & Warehouse Company offer the privilege to its shareholders of record Dec. 12, 1881, of subscribing to an extent not exceeding half of their stock to the 6 per cent. accumulative income bonds of the Virginia Midland Company, at 70 cents on the dollar, with a bonus of 50 per cent. of the subscription, in the common stock of the same company, the subscription to be paid at the office of the company in New York, in two equal installments, the first on or before Dec. 15, 1881, the second when called, upon delivery of the income bonds and stocks.

Wabash, St. Louis & Pacific.—Surveys have been made for a branch from the Indianapolis, Peru & Chicago Division at Plymouth, Ind., to South Bend, about 23 miles. It is said that the branch will be built early next season.

Walton.—This road is now completed and in operation to Walton, Ga., 10 miles from the starting point at Social Circle on the Georgia Railroad.

Waynesburg, Mt. Morris & West Virginia.—This company has been organized at Waynesburg, Pa., to build a railroad from that place south by east to the West Virginia line near Mt. Morris. The distance is about 16 miles. It would be an extension of the Waynesburg & Washington road.

Wilmington & Weldon.—At the annual meeting in Wilmington, N. C., last week, the stockholders voted to authorize the issue of $200,000 additional stock, to be used in paying for the Scotland Neck Branch and in buying additional sleeping cars.

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Chicago & Alton	133, 151	Norfolk & Western	394, 601
Chi., Burlington & Quincy	180	Northeastern (S. C.)	27
Chi. & Eastern Illinois	585	Northern Central	151
Chicago, Mil. & St. Paul	253	Northern (New Hampshire)	291
Chicago & Northwestern	454, 492	Northern Pacific	531
Chi., Rock Island & Pac	291, 367	Ogdensburg & Lake Champlain	354
Chi. & West Michigan	495	Ohio & Mississippi	132, 585
Cin., Hamilton & Dayton	330	Old Colony	641
Cin., Ind., St. Louis & Chi	642	Oregon Ry. & Nav. Co	60
Cin. & Muskingum Valley	349	Pacific Mail Steamship Co	585
Cin., Richmond & Ft. Wayne	394	Paducah & Elizabethtown	408
Cincinnati Southern	27, 206	Panama	207
Cin., Wabash & Michigan	573	Pennsylvania Company	447
Cleve. Col., Cin. & Ind	27, 206	Pennsylvania & New York	44
Columbia & Greenville	476	Pennsylvania Railroad	132
Col. & Hocking Valley	354	Pensacola & Perdido	224
Columbus & Toledo	353	Philadelphia & Reading	422
Concord	290	Phila., Wil. & Baltimore	11
Conn. & Passumpsic Rivers	509	Pitts. & Castle Shannon	120
Consolidation Coal Co	228	Pitts., Cin. & St. Louis	271, 531
Cumberland Valley	546	Pitts., Fort Wayne & Chi	294, 531
Dayton & Union	44	Pitts. & Lake Erie	28
Delaware	59	Pitts., Titusville & Buffalo	27
Del. & Hudson Leased Lines	44	Pitts., Wheeling & Kentucky	649
Delaware & Hudson Canal	105, 568	Portland & Ogdensburg	331
Del., Lack. & Western	120	Portland & Rochester	394
Delaware Western	76	Port Royal & Augusta	195
Denver & Rio Grande	151, 330	Prince Edward Island	92
Det. Grand Haven & Mil	490	Providence & Worcester	426, 615
Det., Lansing & Northern	552	Pullman's Palace Car Co	509
Eastern R. R. Association	300	Pullman Southern Car Co	291
Eureka & Palisade	152	Richmond & Danville	60
European & N. American	602	Richmond, Fred. & Potom.	373, 602
Evansville & Terre Haute	614	Rome, W'town, & Ogdensburg	44
Fitchburg	12	Rutland	427
Flint & Pere Marquette	291	St. Johns, & Lake Champlain	476
Gal., Har. & San Antonio	195	St. Louis, Alt. & Terre Haute	584
Georgia R. R. & Banking Co	286	St. Louis Bridge Co	368
Grand Trunk	234, 553	St. Louis, Iron Mt. & So	120, 546
Great Western, of Canada	235, 649	St. Louis & San Francisco	12, 531
Green Bay & Minnesota	569	St. Paul & Duluth	509
Gulf, Col. & Santa Fe	151	St. Paul, Minn. & Manitoba	495
Hannibal & St. Joseph	163	Sandy River	126
Housatonic	331	Savannah, Florida & Western	461
Houston & Texas Central	315	South Carolina	195
Huntingdon & Broad Top Mt	569	Southern Pacific	331
Illinois Central	76, 120	Terre Haute & Indianapolis	448
Indiana, Bloom. & West	76	Troy & Boston	12
Indianapolis, Dec. & Spr	600	Troy & Greenfield	427
Indianapolis & St. Louis	475	Union Pacific	152, 164
Intercolonial	76	Utah Southern	195
Jeff., Madison & Indianapolis	105	Utica & Black River	105
Junction & Breakwater	331	Vermont & Canada	567
Kan. City, Ft. Scott & Gulf	546	Virginia & Truckee	545
Kentucky Central	76	Wabash, St. L. & Pac	27, 164, 317
Knox & Lincoln	164	Western Union Telegraph	569
Lake Erie & Western	614	West Jersey	475
Lake Shore & Mich So	250, 256	Wilmington & Northern	286
Lehigh Coal & Nav. Co	105	Wisconsin Central	331
Lehigh Valley	44	Worcester & Nashua	76

Boston & Maine.

This company owns a line from Boston to Portland, Me., 115.50 miles, with four short branches, 11 miles in all, making 126.50 miles owned. It leases the Newburyport road, 26.98 miles; the Danvers road, 9.26 miles; the Lowell & Andover, 10.10 miles; the West Amesbury Branch, 4.50 miles, and the Dover & Winnipiseogee, 29 miles, making 79.84 miles leased, and 206.34 owned and leased. The Methuen Branch (owned), 3.75 miles, is leased to the Manchester & Lawrence Company, leaving 202.59 miles worked. Most of the leased lines are practically owned by the company. The report is for the year ending Sept. 30.

The equipment consists of 84 locomotives, 12 snow-plows, 176 passenger-train cars and 1,924 freight and other cars.

The general account is as follows:

Stock (received from sale of 70,000 shares)		$6,921,274.52
Bonds		3,500,000.00
Floating debt, notes payable		500.00
Accounts and balances		32,822.17
Profit and loss		1,673,829.47
Total		$12,128,426.16
Road and equipment	$10,750,983.96	
Investment in leased lines	872,064.32	
Materials and fuel	197,175.01	
Notes receivable	172,219.75	
Cash	135,983.12	
		$12,128,426.16

The bonds all bear 7 per cent. interest. There was no change during the year in the amount of stock or bonds.

The earnings for the year were as follows:

	1880-81.	1879-80.	Inc. or Dec.	P.c.
Passengers	$1,489,534.49	$1,416,167.42	I. $73,365.07	5.2
Freight	1,018,857.01	930,014.93	I. 88,842.08	9.5
Mail and exp.	92,823.90	92,088.78	I. 735.12	0.8
Rents, etc.	86,300.58	94,381.41	D. 8,080.83	8.6
Total	$2,687,515.98	$2,532,652.54	I. $154,863.44	6.1
Expenses	1,749,856.53	1,598,218.42	I. 151,638.11	9.5
Net earnings	937,659.45	934,434.12	I. 3,225.33	0.4
Gross earn. per mile	13,265.79	12,501.37	I. 764.42	6.1
Net earn. per mile	4,628.36	4,612.44	I. 15.92	0.4
Per cent. of exps.	65.11	63.10	I. 2.01	...

Rentals—$87,200 in each year—are included in expenses. All renewals and improvements are charged to expenses, except certain additions to property included in improvement account, as noted below:

The income and profit and loss accounts were as follows:

Net earnings, as above		$937,659 45
Balance of improvement account	$64,433.03	
Interest paid	246,632.59	
		311,065.62
Surplus for the year		$626,593.83
Balance, Sept. 30, 1880		1,761,995.41
Total		$2,388,589.24
Old items charged off	$4,759.77	
Dividends, 8 per cent	560,000.00	
Reserved for improvement account	150,000.00	
		714,759.77
Balance, Sept. 30, 1881		$1,673,829.47

Expenditures on improvement account were for the new iron bridge at Haverhill, filling Prison Point Bay and new second track, in all $233,399.64; the last two will be continued during the current year.

The traffic for the year was as follows:

	1880-81.	1879-80	Increase.	P. c.
Train miles	1,854,048	1,735,103	118,945	6.8
Passengers carried	5,325,375	4,829,028	496,347	10.3
Passenger miles	74,968,911	68,596,870	6,372,041	9.3
Tons freight carried	842,604	810,122	32,482	4.0
Ton miles	41,889,660	39,952,004	1,937,656	4.8

The report remarks the fact that the main income of the road is derived from its local business. In the four years ending with 1881 the total revenue from foreign freight and passenger business was $1,838,436, while the receipts from local business were $6,974,719, local traffic furnishing nearly 80 per cent. of the total income.

During the year the new bridge over the Merrimac at Haverhill has been completed. Several other new bridges have been completed. The work of filling up Prison Point Bay has been continued. The Mystic River wharf has been enlarged and improvements made in the yards at Haverhill and Portland.

During the year 10.11 miles of steel rails and 5.84 miles of new iron rails were laid. There are now 135.56 miles of track laid with steel.

The report says: "The present good condition of our property would seem to require but little expense for repairs for the next five or ten years, yet each year brings new wants and new expenditures. Increased traffic brings increased expenses. Well knowing that no road running out of Boston holds a better position for local traffic than this road, with the connections for through traffic from the West, North and East, we have no hesitancy in saying that its future will be as prosperous as its past. Our equipment has been largely improved during the last year; five locomotives, nine first-class passenger cars, one combined passenger and baggage car, two baggage cars and 93 freight cars have been purchased or built in the company's shops. Of these, one locomotive, one passenger car, and 13 freight cars take the place of the same number worn out and broken up. These items are all charged to expenses. The usual repairs, improvements of track and buildings have been made during the year. New stations have been constructed at Old Orchard, and at Haverhill Bridge in Bradford. New shelter sheds for passengers have been constructed at Portland and Bradford. * * * *

"Our double track has been extended from its termination a year ago, at Newton Junction, to East Kingston, depot, a distance of 4¾ miles, the cost of which has been charged to expenses. This extension gives us, with the 4½ miles from Portland, a perfect double-track road 50¼ miles in length."

TERMINAL FACILITIES IN BOSTON.

The report says: "The want of additional facilities in the city of Boston, for the better accommodation of your large and increasing freight traffic, has for several years been keenly felt by your directors.

"The large outlay of money that would be required to secure such facilities as would prove to be adequate, not only for the wants of to-day, but for many years to come, has prevented an earlier earnest consideration of this subject.

"The time has now come when any further delay of action in this important matter would seem not only to be unwise, but injurious to the best interests of this road. The location of your freight grounds in Boston, between the draw in our bridge over Miller's River and Haymarket square, incumbered as they are by your engine house, repair shops and coal sheds, is, to say the least, unfortunate. In addition to these incumbrances, a double track for passenger traffic divides this whole territory from one end to the other, cutting it for freight uses almost as badly as it would be if the tracks of a foreign corporation occupied the same space.

"These obstructions are the source of much embarrassment and delay, not only in shifting our cars from one track to another, but also in the prompt delivery of freight to our customer. Various schemes for our relief have from time to time been considered; they all involve a large expenditure of money. That which costs the most is not always the most expensive, as is often found to be true in railroad expenditures. In this case the scheme that most commends itself, and at the outset appears to be the most

expensive, it is believed would in the end prove the cheapest. It involves the elevation of two or more tracks for passenger traffic only, commencing at grade on the southerly side of the draw in our bridge over Mystic River in Somerville, and following the line of our location, crossing Mystic avenue and Broadway in the Charlestown District at grade, and all other streets and railroads now crossed at grade at an elevation of not less than fifteen feet above grade, to Haymarket Square in Boston. Such a construction of our passenger tracks would enable us to devote to freight purposes the whole width of our location from Mystic River to Haymarket Square, unincumbered by passenger trains.

"When you consider the number of passenger trains that pass and repass daily between the points above named, through the centre of your freight yard, and that your freight and switching engineers must constantly be on the watch to do their work, you will be able to form some idea of the vexatious delays our men in the freight department are hourly subjected to.

"Your directors, believing the time has arrived when a determined effort should be made to secure better terminal facilities in Boston, ask for authority from the stockholders to take such action as shall be found necessary to accomplish this object, and that they may be authorized to borrow such an amount of money as may be necessary therefor."

Richmond & Petersburg.

This company owns a line from Richmond, Va., to Petersburg, 22.5 miles, with a branch to Port Walthall, 2.5 miles, making 25 miles in all. Its report is for the year ending Sept. 30:

The general account is as follows:

Stock ($10,372 per mile)	$1,009,300.00
Bonds ($8,000 per mile)	200,000.00
Accounts and balances	32,354.12
Profit and loss	39,162.53
Total	$1,280,816.65
Road and property ($50,052 per mile)	$1,251,290.50
Cash and accounts receivable	29,526.15
	1,280,816.65

During the year $25,000 consolidated bonds were issued and $25,000 old bonds retired. The debt consists of $125,000 8 per cent. first-mortgage bonds; $50,000 consolidated 7 per cent. bonds, and $25,000 consolidated 6 per cent bonds.

The earnings for the year were as follows:

	1880-81.	1879-80.	Increase.	P. c.
Passengers and mail	$89,702.29	$82,524.43	$7,177.86	8.9
Freight, etc	96,203.11	81,673.83	14,529.26	17.7
Total	$185,905.40	$164,198.28	$21,707.12	13.2
Expenses	99,978.70	85,099.15	14,879.57	17.4
Net earnings	$85,926.70	$79,099.15	$6,827.55	8.6
Gross earn. per mile	7,434.22	6,567.93	866.29	13.2
Net " " "	3,437.07	3,163.97	273.10	8.6
Per cent. of exps.	53.77	51.82	1.95	....

The expenses were divided, $47,738.58 to passenger and $52,240.12 to freight business. Expenses include about $15,000 for improvements and new equipment.

Interest paid was $16,099.69, leaving a balance of $69,827.01, from which dividends of 6 per cent. were paid.

Traffic statements for the year are as follows:

	Passenger.	Freight.	Total.
Miles run by trains	50,261	29,463	79,724
Earnings per train mile	$1.78	$3.26	$2.33
Net " "	0.83	1.49	1.08
Miles run by cars	246,091	449,688	695,779
Cost per car mile	19.39 cts.	11.61cts.	.....
Passenger miles	2,457,617	.....	.....
Ton-miles	.....	2,746,449	.....
Earn. per pass. per mile	3.0325 cts.	.....	.....
Earn. per ton per mile	.....	3.33cts.	.....
Cost per ton per mile	.....	1.16 "	.....
Av. train load	48.89	93.22	.....

The business of the road shows a very considerable increase, and has now reached a point where additional facilities for handling it are needed.

During the year 200 tons of steel rails were laid; nearly all the main track is now of steel. The old wooden bridge over Swift Creek has been replaced with an iron one. Work is soon to be begun on the renewal of the James River bridge.

The Anderson warehouse in Richmond was bought for $18,000 and paid for out of current revenue. The buildings were pulled down and the land will be used for additional yard and freight-house room.

One freight engine and nine freight cars were added to the equipment. Two passenger cars were bought to replace old ones sold. A driving-wheel lathe was added to the shop equipment.

It is believed that the James River bridge can be gradually renewed without interfering with the dividends.

New York & New England.

This company on Sept. 30, 1881, the close of its last fiscal year, worked 358 miles of road, the main line from Boston to Brewsters, N. Y., 190 miles, and 168 miles of branches, of which 116 miles are owned, and 52 miles (the Rhode Island & Massachusetts, 13.6 miles, the Rockville, 4.4, and the Connecticut Central, 34 miles) leased. The chief branches owned are from Providence, R. I., to Willimantic, Conn., 58.5 miles; from Brookline, Mass., to Woonsocket, 33.75 miles, and from East Thompson, Conn., to Southbridge, Mass., 17.5 miles. Of the main line 46 miles, from Waterbury to Brewsters, was worked only two months of the year. A further extension of 40 miles from Brewsters to Fishkill is nearly ready for use, all the track being laid.

The equipment consists of 103 locomotives; 130 passenger, 3 sleeping and 30 baggage cars; 1,925 freight and 450 gravel and other cars. There were 16 locomotives, 15 passenger cars, 1 sleeping car, 337 freight and 178 other cars added during the year.

The company works the Norwich & Worcester road, 66.4 miles, under lease, but its accounts are kept separately, only the net profit or loss from the lease appearing on this company's books.

The liabilities as reported to the Massachusetts Commission are as follows:

Stock	$20,000,000
Funded debt	8,968,000
Floating debt and current accounts	2,838,809
Profit and loss	833,408
Total	$32,640,217

The stock as reported consists of the $20,000,000 bonds under the Berdell mortgage, by foreclosure of which the present company acquired the road. All of these are convertible into stock; on Sept. 30 last $7,512,000 had been so converted, and on Nov. 22 the amount converted had been increased to $10,759,000.

The bonded debt consists of $5,968,000 general mortgage 7 per cent. bonds and $3,000,000 general mortgage 6 per cent. bonds. This amount was increased during the year by the sale of $2,250,000 of the 6 per cent. and $250,000 of the 7 per cent. bonds. The total amount received for the bonds has been expended in discharging underlying liens and for permanent improvements upon the property of the company, as follows:

Discharging underlying liens	$4,466,207.14
Extension from Waterbury to Hudson River	2,477,748.95
New equipment	1,358,816.39
Real estate and right of way on line of old road	180,332.47
New stations, water tanks, turn-tables, etc	89,566.76
Superstructure, new culverts, etc	35,195.40
Machine shops, machinery and engine houses	210,092.40
Double track extension to Franklin and at Hartford	150,040.49
Total	$8,968,000.00
The total floating debt of the company Sept. 30, 1880, was	$1,826,054.76
This amount has been increased during the year	154,486.31
Making the total floating debt, Sept. 30, 1881	$1,980,541.07

This amount has been expended as follows:

For terminal lands in Boston	$1,676,377.25
Bonds of Connecticut Central Railroad	283,642.37
Ridge Hill & Winslow's Branch	20,521.45
Total	$1,980,541.07

The report refers to the extension to the Hudson River at length. The road-bed, bridges, station buildings and track superstructure are all in a first-class condition. The company expended upon the extension of its road west of Waterbury $2,477,748.95, and this is in addition to the three millions spent by the Boston, Hartford & Erie upon this portion of the property. From this expenditure of nearly six millions no income has yet been derived, but now, about 30 years after the line was projected, and 15 years after work upon it had actually begun, the road may be regarded as completed, and its value will soon be practically demonstrated

The traffic for the year was as follows:

	1880-81.	1879-80.		P. c.
Passengers carried	3,492,560	3,121,057	371,503	11.6
Passenger miles	45,702,022	41,762,072	3,939,950	9.4
Tons freight carried	1,176,795	968,549	208,246	21.5
Ton miles	64,562,685	45,678,700	20,883,985	47.8

The average receipts per passenger per mile were 2.25 cents. Of the ton-miles 79.8 per cent. were of through freight. The through freight, however, contributed only 59.1 per cent. of the freight earnings, the rates upon it being very low for a considerable part of the year.

The earnings for the year were as follows:

	1880-81.	1879-80.	Increase.	P.c.
Passengers	$1,025,585.75	$893,516.51	$136,069.24	15.2
Freight	1,420,758.30	1,250,526.93	170,231.37	13.6
Mail and express	106,436.50	87,034.88	19,401.62	22.3
Miscellaneous	135,593.65	93,862.20	41,731.45	44.4
Total	$2,692,374.20	$2,324,040.52	$367,433.68	15.8
Expenses	1,841,497.93	1,552,955.35	288,542.58	18.6
Net earnings	$850,876.27	$771,985.17	$78,891.10	10.2
Gross earn. per mile	8,335.52	7,038.47	397.05	5.0
Net earn. per mile	2,634.29	2,635.93	.....	...
Per cent. of expenses	68.39	66.79	1.60	....

Expenses were increased by renewals on the older part of the road, by heavy necessary expense for motive power, and by the use of a considerable part of the equipment for construction purposes. They were also affected by the low rates and by the failure of the peach traffic, usually very profitable.

The income account was as follows:

Net earnings	$850,876.27
Premium on bonds sold	113,994.15
Total	$964,870.42
Insurance and taxes	$84,545.38
Interest	590,143.62
Rentals	74,296.63
Bad accounts charged off	382.20
	749,367.83
Surplus for the year	$215,502.59
Surplus from previous year	617,905.00
Total	$833,407.59

This surplus has been expended in permanent improvements upon the property of the company since this company took possession of it in 1875, as follows: New side tracks, $68,396.40; new bridges, $46,885.95; improvements at station, paving, grading, etc., $54,271.09; steel rails, $107,767.53; improvements on terminal lands at Boston, $515,187.03; stock in New England Transfer Company, $40,900; total surplus, $833,408. The physical condition of every portion of the property has not only been maintained, but the road-bed, bridges, platforms, stations and other buildings have been greatly improved and added to.

The bonded and floating debt, incurred to obtain possession of its property, for permanent improvements thereon, and for new equipment in use by the road at the end of the fiscal year, amounted to about $6,500,000. The balance of the debt of the company was nearly all incurred for the extension of the road from Waterbury to the Hudson River, for new equipment, and for terminal facilities at Boston, from which scarcely any revenue was derived during the past year, owing to their incomplete condition.

The amount paid for rent of other roads was larger than last year, because of a larger deficit in the earnings of the Norwich & Worcester road, which failed to earn the dividend guaranteed by this company.

Regarding the terminal facilities in Boston, the report says that the work in progress to prepare them for a large Western and export business, as well as for the local business of the road, has been rapidly pushed forward; that the additional freight stations and warehouses constructed have not furnished more accommodation than the growing business upon the old road of the company demanded, leaving much yet to be done if the new connections with the Erie and Pennsylvania systems should develop the large amount of business expected. To meet this want, the company is constructing a grain elevator of 500,000 bushels capacity, which will be ready for use by January next. It is also completing the filling of the 50-acre tract bought from the Boston & Albany road, and the 13-acre tract bought from the state.

About 17 acres have already been filled to grade, and will soon be utilized for freight purposes. The construction of a new pier on the 50-acre tract, to be called Pier No. 3, has been begun, and will be completed before the close of another year. A large and profitable business has already been secured by contract for this pier and the buildings to be erected thereon. Dock No. 2, as partially constructed by the Boston & Albany road, is being lengthened to 850 ft., because of the fact that its original length was too long to berth one steamer and not long enough for two. On the 25-acre lot purchased from the state, a large freight-shed, which covers 121,000 square feet, was finished in May, and has proved a valuable auxiliary to the company's business by attracting a line of transatlantic steamers, and offering superior facilities to transient steamers and sailing vessels in receiving and discharging their cargoes. Work has been begun on another warehouse of about the same size as the above, to be located on the opposite side of dock No. 1. A new freight-house, adjacent to the two large freight-houses already in use, is also being constructed and will soon be finished. It is estimated that the cost of completing the improvements under way and contemplated upon the terminal grounds in Boston will be about $1,000,000.

The extension of the second track to Hartford during the coming year will be an absolute necessity in order to meet the demands made upon the road for the transportation of freight and passengers.

In closing, the report refers to the connections secured by the extension to the Hudson River, and to the heavy business to be expected from the opening of the line.

Buffalo, New York & Philadelphia.

This company owns a line from Buffalo, N. Y., to Emporium, Pa., 121 miles. The figures given below are from statements published of its operations for the year ending Sept. 30.

The equipment consists of 33 locomotives, 15 passenger cars and 1,913 freight cars.

The earnings for the year were as follows:

	1880-81	1879-80	Inc. or Dec.		P. c.
Passengers	$173,116.46	$154,470.64	I.	$18,645.82	12.1
Freight	938,609.43	846,512.48	I.	91,46 6.95	10.8
Mail, etc	31,088.13	30,364.18	I.	723.95	2.4
Total	$1,142,214.02	$1,031,347.30	I.	$110,866.72	10.7
Expenses	634,495 42	687,424.43	D.	52,929 01	7.7
Net earn.	$507,718.60	$343,922 87	I.	$163,795.73	47.6
Gross earn. per mile	9,439.79	8,523.53	I.	916.26	10.7
Net earn per mile	4,196.02	2,842 34	I	1,353.68	47.6
P. c. of exps.	55.56	66 65	D.	11.09	....

The increase in earnings was considerable and that in net earnings very large. Interest paid was about $210,000 for the year.

During the year 1,266,739 tons of freight were moved and 323,197 passengers carried. The road has been extremely fortunate, in that of all the passengers carried in its cars not one has met with any serious accident during the year.

The road is laid with steel rails throughout its entire length, from Buffalo to Emporium.

The number of employés has averaged 974 per month.

The surplus earnings, after the payment of interest on the bonds, have been expended wholly in improving the track and increasing the equipment.

The Olean, Bradford & Warren and the Kendall & Eldred roads are controlled and worked in this company's interest, although their accounts are separately kept.

During the year the controlling interest in the road has been sold to a syndicate which also controls the Buffalo, Pittsburgh & Western road.

Fitchburg.

This company worked during the year ending Sept. 30, 1881, the main line of 50.68 miles from Boston to Fitchburg, and 42.64 miles of branches owned, and the Vermont & Massachusetts road, 56 miles of main line and a branch of 2.80 miles. It also ran trains over the Troy & Greenfield road, owned by the state of Massachusetts, making its main line 143½ miles long, from Boston to North Adams. The total mileage, including the Troy & Greenfield road, was 189 miles. The following figures are from the report to the Massachusetts Commission.

The equipment includes 91 engines, 128 passenger-train cars, 3,020 freight cars and 167 service cars; an increase of 10 engines, 14 passenger, 599 freight and 41 service cars.

The liabilities at the close of the year were as follows:

Stock	$4,950,000
Funded debt	2,000,000
Current accounts and floating debt	2,033,441
Profit and loss	426,909
Total	$9,410,350

During the year stock was increased by $450,000, funded debt by $500,000, and the current liabilities and floating debt by $723,441.

The report further shows that the new construction during the year amounted to $601,242. There was also invested in the Hoosac Tunnel Dock & Elevator Company $280,500; upon the Vermont & Massachusetts Division, $371,000; and upon the great freight yard in Somerville, $110,000.

The traffic for the year was as follows:

	1880-81.	1879-80.	Increase.	P. c.
Passengers carried	2,657,984	2,461,603	196,381	8.0
Passenger-miles	42,854,047	39,752,302	3,101,745	7.8
Tons freight carried	1,776,960	1,546,950	230,010	14.9
Ton-miles	114,507,916	109,323,290	5,184,626	4.7

The number of passengers to and from Boston was 1,853,679, an increase of 9 per cent. The average rate per passenger per mile was 1.82 cents, a decrease of 4.7 per cent.

The company reports 2,111 persons employed on the road. There 26 persons killed and 68 injured on the road, against 4 killed and 18 hurt in the preceding year.

The earnings for the year were as follows:

	1880-81.	1879-80.	Inc. or Dec.		P. c.
Gross earnings	$2,655,829	$2,464,599	I.	$191,230	7.8
Expenses	2,127,437	1,725,535	I.	401,902	23.3
Net earnings	$528,392	$739,064	D.	$210,672	28.5
Gross earn. per mile	14,052	13,040	I.	1,012	7.8
Net " "	2,796	3,910	D.	1,114	28.5
Per cent. of expenses	80.10	70.01	I.	10.09	.....

The increase in expenses, which reduced the net earnings so largely, is partly explained below; much of it was doubtless due to the very low rates on through business for part of the year, and something also to the general increase in cost of labor and materials.

The result of the year was as follows:

Net earnings, as above		$528,392
Interest	$140,180	
Rentals	237,811	
Dividends, 7 per cent	315,000	
		692,991
Deficit for the year		$164,599

Notwithstanding this deficit, the directors at their meeting in Boston last week decided to pay the stockholders a dividend of 3 per cent for the past half-year. They took the position that the present condition of affairs is only temporary, and that they were justified in taking from their surplus sufficient to make up the next dividend. The past year's operations of the Fitchburg Railroad have been marked by several unprecedented occurrences which more than anything else have interfered with a successful return. Beginning with October last year there was a serious blockade owing to a lack of terminal facilities at this end of the road, extending into December. In January, February and March there was a disastrous snow blockade upon the New York Central, followed by a strike of brakemen lasting about three weeks. Soon after this the ruinous warfare in through rates began and is still being furiously fought. Add to these drawbacks the want of terminals in the shape of elevators and wharves, which are now nearly ready for business in the Charlestown District, and the condition of the Vermont & Massachusetts Division, a large portion of which is being double-tracked, and it is surprising that the road makes as good a showing as it has for the past year's work.